UNITED STATES
DEPARTMENT OF AGRICULTURE

YEARBOOK OF AGRICULTURE
1933

MILTON S. EISENHOWER
Editor

ARTHUR P. CHEW
Associate Editor

DIRECTOR OF AGRICULTURE
28 JAN 1934
MADRAS

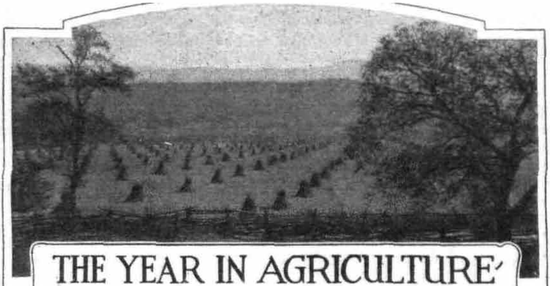
UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1933

FOREWORD

THIS Yearbook differs somewhat in form and content from those issued for the last six years. It condenses the latest scientific achievements of the United States Department of Agriculture in the Secretary's annual report to the President, instead of giving them extended treatment in articles by individual specialists. Space thus becomes available for describing the agricultural effects of the depression and for summarizing recent developments in farm practice. ¶The object is twofold: (1) To show in some detail what the depression has done to agriculture as a whole and to the leading agricultural enterprises separately; and (2) to indicate what the farmers themselves are doing or can do with the aid of science to improve the situation. Farmers always need technical efficiency. The details of efficient practice may change, as happens for example when low prices affect outlay for machinery or fertilizer; but the essentials remain. Agriculture must keep its costs down and must furnish what the market wants. ¶In emphasizing what agriculture can do *for itself*, the Yearbook necessarily leaves out of the reckoning many nonagricultural factors in the depression. Such factors are enormously important. The remedy for agriculture's difficulties *is not the job of the farmers alone. It requires the cooperation of industry*, finance, and Government. Each group, however, has its own special responsibility. This department is concerned specially, though not by any means exclusively, with farm production and marketing. It presents facts relating to its own work as a contribution to the solution of what is really a world problem rather than merely an agricultural problem. ¶In other words, the department deals in this volume with the phases of agriculture's problem which are its particular concern. Equally vital matters, such as fiscal policy, foreign finance and credit, and international relations generally, do not come directly within its province. The department studies the adjustment of farm production to the probable demand, the improvement of marketing methods, the reduction of costs through the development of better livestock and better varieties of plants, the control of agricultural pests and diseases, the organization of the farm business, and so forth. It furnishes information about these things in the Yearbook in the belief that neither individual farmers nor public agencies can dispense with such information in striving to promote agricultural recovery. ¶Grouped under commodity headings, the articles in this volume survey broadly the economic and technical developments that have dominated agriculture since the war. The record is comprehensive and well proportioned, if not exhaustive. It gives as much place to the practice of farmers as it does to the recommendations of science. The last decade has been one of extraordinary technical progress in agriculture, and this seems a good time to bring the outstanding results into a focus. The Yearbook contains also a compilation of the principal agricultural statistics.

CONTENTS

	Page
The Year in Agriculture	1
Agriculture and the World Crisis	91
Cotton	97
Wheat	139
Feed Grains and Forage	171
Livestock	219
Dairying	275
Poultry and Eggs	303
Fruits and Vegetables	319
The Farm Business and the Farm Home	369
Agricultural Statistics	399
Statistics of Grains	403
Statistics of Cotton, Sugar, and Tobacco	472
Statistics of Fruits and Vegetables	508
Statistics of Miscellaneous Crops	563
Statistics of Beef Cattle, Hogs, Sheep, Horses, Mules, and Asses	589
Dairy and Poultry Statistics	634
Statistics of Foreign Trade in Agricultural Products	667
Farm Business and Related Statistics	697
Miscellaneous Agricultural Statistics	740
Index	777



THE YEAR IN AGRICULTURE

THE SECRETARY'S REPORT TO THE PRESIDENT

WASHINGTON, D. C., *October 31, 1932.*

To the PRESIDENT:

In any period of deep and prolonged depression it is difficult to recognize exactly the first signs of improvement. Nevertheless, it is significant that after a ruinous 3-year decline agricultural prices rose materially during July, August, and September of 1932. In October they receded somewhat, but not to the lows registered in midsummer. Agriculture felt the shock of this depression earlier and harder than other industries, and it may lead in the recovery.

Farm-commodity prices rose from 52 per cent of the pre-war level in June, 1932, to 59 per cent of that level in September; in the succeeding month they fell off 3 points to 56 per cent. The months during which the farm-commodity price index rose saw an opposite movement in the prices of the things that farmers usually buy. The index for this group of commodities dropped from 110 to 106 per cent of the pre-war average. These opposite price movements increased the unit purchasing power of agricultural products 16 per cent.

Considered merely as net gain, that was not much. But the change was encouraging. It was the first substantial improvement in agricultural prices since the onset of the depression in 1929. Furthermore, it applied to certain branches of agriculture that were heavily burdened with surpluses. The index for cotton and cottonseed prices rose between June 15 and September 15 from 37 to 57; in the same period the index for the prices of meat animals rose from 57 to 67; the dairy-products index rose from 62 to 67; and the poultry and poultry-products index from 59 to 84. On the other hand, the index for grains dropped from 44 to 41; and that for fruits and vegetables from 82 to 68.

To some slight extent this improvement in prices reflected a reduction in the supply of farm commodities. It resulted, mostly, however, from many fundamental readjustments in the financial and business world. As the year advanced bank failures declined.

Easier credit conditions and lower interest rates furnished a basis for renewed enterprise. Confidence in the business outlook increased. This was shown by a considerable recovery in the bond and stock markets. Stronger markets seemed to mark the end of uncertainty and the return of confidence.

This renewed confidence is not confined to the United States. Gold is again coming into this country, indicating restored world confidence in the American dollar. In Europe the Lausanne agreement, the firmer tendency of prices of many products, and the rise in the American stock market favorably influenced foreign business sentiment.

These readjustments and the changing outlook are providing a basis for an improvement in the demand for agricultural products. While unemployment and reduced wages of urban consumers are still a great handicap in the marketing of farm products, the upturns in the financial situation in the past few months, if sustained, will be a stimulus to increase employment and will thus increase the purchasing power of urban consumers. Furthermore, the improvement in the prices of agricultural products will increase the demand for manufactured goods and thus give further impetus to a general revival in business activity. This in turn will add further strength to the market for agricultural products.

In planning production and marketing for another year, farmers must bear in mind, of course, that the road to recovery may not be a continuous and rapid climb. Temporary setbacks are to be expected. But there are many indications that material improvement in the income from agriculture will occur within the next few years.

In this annual report conditions of the past year rather than prospects must necessarily predominate. Recent changes, though full of promise, have not yet greatly bettered the farmers' position. It is my purpose to analyze this position frankly. I shall summarize the general condition and show its bearing upon farm incomes, commodity prices, land valuations, taxation, credit, and exports and imports of farm products.

Demand

The current depression has caused greater shrinkage in demand for farm commodities, in farm-commodity prices, and in farm incomes than has any similar decline recorded in the last 70 years. Consumption of the more expensive commodities has declined. Consumption of the cheaper commodities has remained practically unchanged, and indeed, in some cases has increased. Nevertheless, prices of all commodities, have fallen. Farmers have had to take terrific price cuts to move their goods. The situation has demonstrated again the old truth that it takes purchasing power, as well as consumption, to keep prices up.

Farmers have witnessed a precipitate fall in purchasing power. The factory pay-roll index for the United States, for example, was 50 per cent lower in the first quarter of 1932 than in the first quarter of 1928. Railroad pay rolls were about 40 per cent lower, and construction pay rolls about 80 per cent lower. Generally speaking, it was the same in foreign countries. In some of the principal countries that take American farm products, employment and consumer buying power declined more than in the United States. Our agricultural

exports therefore had to fall in volume, and even more in value. In the two crop years 1929–30 and 1930–31, farm exports from the United States declined twice as much in value as in volume. This meant that American farmers were exporting their surpluses at bargain prices. Even so, great surpluses remained unsold. But for price cuts, the surpluses would have been mountain high. Reduced buying power abroad was not the only cause of the drop in our agricultural exports. Increased farm production in Europe and elsewhere had a great deal to do with it. So did import restrictions established by foreign countries because of their reduced buying power and because of their desire to maintain their gold reserves. Recent export statistics bear out what I emphasized in my report last year, namely, the impossibility of maintaining our agricultural export trade at the volume it reached during the World War and immediately after.

Stability of Production

In the last few years changes in demand have predominated over changes in production as the chief cause of price declines. Agricultural production in the United States has been fairly stable since 1924. There have been regional ups and downs and shifts in the importance of different crops. Grain production has declined, while the production of meat animals has remained about the same. The production of dairy products, poultry, truck crops, and fruits has increased. Cotton production declined this year. Broadly, declines in some directions have been offset by gains in others.

It is inaccurate to attribute the price slump in recent years solely to general agricultural expansion. It can be attributed in part to the fact that production did not fall so rapidly as demand. In this respect the agricultural reaction to the depression was very different from the industrial reaction. In 1931 farm production in the United States was about the same as it was in 1928, whereas the production of nonagricultural commodities was nearly 50 per cent less. This is not said in criticism of farmers. Farm production can not be adjusted quickly to changes in demand. This fact is a disadvantage to the individual farmer. It makes agriculture the great shock absorber and stabilizing influence in hard times. Sustained farm production, though it helps to force prices down, makes life easier for wage earners with reduced incomes, and lessens the burden of unemployment relief. It is necessity, of course, and not philanthropy, that obliges agriculture to fill this rôle. Nevertheless, agriculture does so, to the substantial benefit of the community. This should be remembered when farmers ask public support for agricultural relief measures.

Farm Prices and Purchasing Power

During the depression there developed, until the last few months, an increased spread between prices received by farmers for their products and prices of nonagricultural goods. From August, 1929, to August, 1932, prices of all groups of farm commodities, at the farm, declined nearly 60 per cent; wheat prices dropped 65 per cent, cotton prices dropped 64 per cent, wool prices 74 per cent, and hog prices 60 per cent. In the same period nonagricultural prices at wholesale declined 24 per cent. Another measure of the disparity is still more striking. This shows the ratio of prices received to prices paid by farmers at retail for commodities used in farm living and production.

In August this ratio was only 54 per cent of the pre-war ratio. In other words, farm-commodity purchasing power was little more than half what it was before the war.

Gross Farm Income

Gross farm income from agricultural production in the United States in 1932 will be lower than it was in 1931. Gross income in 1931 was $6,955,000,000 compared with $9,403,000,000 in 1930 and $11,950,000,000 in 1929. These changes represent a decline of more than 40 per cent in two years. The decline was greater in the income from field crops than in the income from livestock. Before the war field crops yielded the greater return; since 1921 livestock has produced more income. Recent years have accentuated the new trend. From 1924 to 1931 income from livestock and livestock products dropped only 19 per cent, as compared with a drop of nearly 74 per cent in the income from grains. Livestock enterprises suffer less from foreign influences than do many field crops, since they rest more broadly on the home market. Hence the increasing importance of livestock may forecast greater stability for American agriculture.

Net Incomes

Net farm incomes will probably decline proportionately more than gross farm incomes this year, just as they did in 1931 and 1930, since the expenses of production have declined far less than prices of farm products. In 1930, out of a gross income of $9,406,000,000, the farmers, after paying expenses of production, interest, rent, and taxes, had $3,553,000,000 left as a return for their capital, management, and labor. In 1929 the net income for capital, labor, and management was $5,853,000,000. The average farm operator that year, after paying expenses of production, interest, rent, and taxes, had about $847 left. The average net return fell to $566 in 1930 and to $342 in 1931. Feeds, hired labor, and machinery are the principal items on which farmers in the last few years have been able to cut down their expenses. They have had little relief from interest and taxes.

Capital Account

Agriculture has also lost heavily in its capital account. The total value of all capital employed in agricultural production as of January 1, 1932, was $44,339,000,000, as compared with $58,249,000,000 on January 1, 1930, a decline of about 24 per cent. Farmers' equities in their property decline along with their current incomes, so that their financial security as well as their standard of living is impaired.

Farm real-estate values continued to fall in nearly all parts of the country. In the 12 months ended March 1, 1932, the declines exceeded those of the previous year. The department's index showing the estimated per acre value of farm land for the United States dropped from 106 per cent to 89 per cent of the pre-war (1912–1914) average. More than two-thirds of the States reported lower than pre-war levels. Only two geographic divisions, the New England and the Pacific, with indexes of 116 and 118, respectively, reported average values higher than those of the pre-war period. Average values fell 3 per cent below the pre-war level in the east and west South Central States, 4 per cent below that level in the South Atlantic

and Middle Atlantic States, 18 per cent below in the Mountain States, 19 per cent below in the west North Central States, and 27 per cent below in the east North Central States.

The current decline in farm-land values started not from a relatively high level but from a relatively low level. In that respect it differs from the first post-war slump. In large measure the decline in farm land values after 1920 liquidated a wave of speculation. The current decline reflects a writing down of values to correspond with a lower commodity price level.

Mortgage Debt

Mortgage debt presses upon American agriculture to-day with exceptional severity. Total farm-mortgage debt in the United States increased from $3,300,000,000 in 1910 to $7,900,000,000 in 1920, and to $9,500,000,000 in 1928. Since then it has fallen slightly, largely as a result of foreclosures. Interest and attendant costs on this mortgage debt in 1930 represented a fixed annual charge of $568,000,000. While the capacity to carry this charge has declined greatly in the last two years, the charge itself remains about the same. In 1931 interest on the farm-mortgage debt absorbed about 8 per cent of the gross farm income, compared with 4 per cent in 1920 and 3 per cent in 1910. In recent years an increasing number of farms have been mortgaged. The department estimates that in 1930, 40 per cent of all farms were mortgaged. The 1930 census reported 42 per cent of all owner-operated farms as mortgaged, compared with 37.2 per cent in 1920.

Foreclosures are all too prevalent. They are blighting the hopes of men who can get as much out of the land as anyone could. Keeping efficient farm owners on their own property and in their own homes is to the interest of both debtors and creditors. It is also to the interest of the Nation. Much mortgage indebtedness has grown burdensome from forces largely outside the farmer's control. I shall later show how Federal aid in the field of farm credit has helped. But more needs to be done. The powers of our credit institutions must be broadened and legal restrictions relaxed so that in an emergency like the present one efficient farmers can be given a fighting chance to hold their homes.

Taxes

Farm-property taxes have remained practically unchanged during the depression, although in a very few States farmers have received substantial relief. Taxes for the country as a whole have been, in the last two years, about 166 per cent higher than they were in 1914. With gross farm incomes down to the pre-war level, the tax load is extremely onerous. As in the case of the mortgage-debt burden, its real weight has been doubled by falling prices since 1929. It takes *more than four times as many units of farm produce to* pay the farm tax bill now as it took in 1914. In 1931 taxes on farm property absorbed about 11 per cent of the gross farm income, compared with only 4 per cent before the war.

I have repeatedly called attention to the farmers' unfair tax burden. It is a result not only of increases in public expenditures, but of the failure of our tax system to allow for the postwar decline in farm incomes. Simple justice requires both economy in public expendi-

ture and drastic revision of the revenue system. Farm-tax studies by the department and by State institutions over a period of years point to the conclusion that the tax system discriminates against the farmer, and show that the injustice is greater now than it was a few years ago. That unfairness exists is generally acknowledged. Its recognition should form a basis for action. The tax that discriminates against the farmer is the so-called general-property tax. It is not part of the Federal revenue system. Hence Federal action is limited to investigation and explanation of the problem, and to such changes in the Federal system as will encourage helpful changes in State and local taxation.

During the past year the department has sought to ascertain: (1) The amount and trend of farm taxation since 1913, by States and for the country as a whole; (2) the reasons for differences and similarities in these changes in various States and regions; (3) possibilities for tax reduction by revision of the revenue system; (4) possibilities for reduction through reorganization of rural local governments.

This program of investigation, though not long under way, has produced significant data, including reliable figures for individual States showing the amount and the trend of farm taxes per acre since 1913.

Tax revision calls for substitutes for a substantial part of the general-property tax levy. Income taxes and excise taxes are the leading alternatives. These revenue sources are now the main reliance of the Federal Government. Attempts by States to draw large revenues from these sources necessitate coordination of Federal and State systems to avoid new inequalities. There is increased public recognition of the need for coordinating State and Federal taxes as a step toward State tax revision for the relief of farmers and home owners.

Farm-tax reduction through reorganization of rural local government is an important possibility. Results of the department's first efforts to appraise the significance of this possibility in certain localities will become available shortly. A comprehensive program for farm-tax reduction must reduce waste, ineffectiveness, and duplication in local governmental units.

Credit Conditions

It was inevitable in the generally depressed condition of agriculture that farm-credit facilities should be strained. Local credit agencies, such as country banks and merchants, depend for their lending power on a flow of income into their communities. When this flow dwindles or dries up, outstanding loans can not be collected and new loans can not be made. What ordinarily amounts to a revolving fund ceases to revolve. Farm incomes from the production of 1931 dropped so low that country banks generally could maintain only a small fraction of their lending power. These banks, moreover, had to stand the additional stress of the customary outflow of agricultural funds in mortgage interest, tax payments, and so forth.

Agricultural distress affected the supply of mortgage credit as well as the supply of bank credit. Delinquent interest payments and a high foreclosure rate impressed mortgage lenders unfavorably. Special factors in the investment market made matters worse. Life insurance companies, the chief lenders on farm-mortgage security,

had to meet an exceptional demand for policy loans; also the value of their railroad and industrial securities declined drastically. The Federal land banks and the joint-stock land banks found the bond market unsatisfactory for the sale of additional securities. The credit stringency tended still further to lessen the earning power of the farmers. It handicapped them in readjusting their crop programs. It prevented the efficient utilization of feed and of labor time. Often, indeed, lack of production credit compelled the premature selling of livestock.

Federal Credit Assistance

The Federal Government relieved this situation in several ways. It authorized production loans out of relief appropriations remaining unexpended in 1931. It made additional provision for production loans in the Reconstruction Finance Corporation act. It amended the laws governing the operations of the Federal intermediate credit banks in such a manner as to increase their lending power. It appropriated $125,000,000 to increase the capital stock of the Federal land banks. Another measure authorized the Secretary of Agriculture to make loans out of a $10,000,000 revolving fund to assist individuals in organizing or enlarging agricultural-credit corporations and livestock-loan companies. This fund may not be much used, because the Reconstruction Finance Corporation is organizing regional agricultural-credit corporations to occupy the same field. Other Federal legislation, suggested by the President, helped to relieve the farm-credit stringency. The Glass-Steagall bill permitted the Federal reserve banks to use the direct obligations of the United States Government as collateral for Federal reserve notes, and thus released gold for other credit purposes. It also authorized the Federal reserve banks to make advances to member banks on paper eligible for rediscount. This legislation relieved pressure on country as well as on city banks and put many of them in a position to increase their loans. The Reconstruction Finance Corporation helped agriculture through the relief it extended to banks generally.

Loans to Farmers

As already mentioned, relief appropriations granted in 1931 provided some funds for production loans. The Department of Agriculture administered these funds. It granted therefrom some 51,000 loans aggregating approximately $8,195,000. South Dakota farmers borrowed $3,274,653; North Dakota farmers borrowed $2,419,089; Montana farmers borrowed $1,022,582; Nebraska farmers borrowed $604,822; Utah farmers borrowed $479,703; and those in other States borrowed $394,000. In these States severe drought in the summer and fall of 1931 depleted feed supplies. The loans, which were secured by livestock liens, enabled farmers to maintain their breeding herds and work stock.

This department also administered production credit made available for 1932 in the Reconstruction Finance Corporation act. The measure authorized the corporation to turn over to the Secretary of Agriculture $50,000,000 of its capital stock, and a proportion of the additional funds obtained through the sale of bonds and debentures. The corporation thus made $75,000,000 available to the Secretary for crop-production loans, out of which sum $64,203,773 had been

loaned to 507,643 borrowers up to August 31, 1932. The loans, which averaged $126.47, went principally to farmers in the Northwestern States and in the Cotton Belt. There was some borrowing, however, in all the States except Rhode Island.

Federal Intermediate Credit

Under the new law governing the operations of the Federal intermediate credit banks, Congress gave these banks acceptance powers that broadened their financing facilities, particularly their marketing-credit facilities. It made the debentures of the intermediate credit banks eligible as collateral for 15-day notes when submitted by member banks to the Federal reserve banks. This provision made intermediate credit bank debentures more desirable as a short-time investment for commercial banks. The legislation, in short, increased the marketability of the debentures issued by the intermediate credit banks. As a result, these debentures sold in the summer of 1932 at the lowest interest rate since the banks were organized. Farmers benefited by a corresponding reduction in the cost of intermediate bank credit to agriculture.

Agricultural-Credit Corporations

The Reconstruction Finance Corporation is organizing regional agricultural-credit corporations under a more comprehensive principle than that contemplated in the legislation appropriating $10,000,000 to assist individuals in buying the stock of agricultural-credit corporations or livestock-loan companies. Congress authorized the Reconstruction Finance Corporation to set up a regional credit corporation, with a minimum capital of $3,000,000, in each Federal land bank district. Ten such corporations have already been established. They have power to rediscount agricultural paper with the Federal intermediate credit banks and the Federal reserve banks and also with the Reconstruction Finance Corporation. They make loans for production, including feeding, and for marketing. They began by making available credit for the feeding of livestock, because credit for that purpose was in particularly keen demand. Important benefits should result. Previously existing credit facilities did not, even in normal times, fully meet the need for livestock-production credit. In times of falling prices they were wholly inadequate.

Federal Land Banks

In providing $125,000,000 of new capital for the Federal land banks, Congress authorized these institutions to give hard-pressed borrowers more time to pay their loans. It earmarked for that specific purpose $25,000,000 of the amount appropriated. The sum became immediately available for the relief of farmers who could not meet their payments. The law provided that this $25,000,000 should be used exclusively to supply the Federal land banks with funds to use in place of the money of which they would be temporarily deprived by granting extensions. It directed the banks to grant extensions whenever, in their judgment, conditions warranted. This policy is financially sound, as well as humane. The emergency that makes many farmers unable to carry their mortgages will pass. When farm earning power revives, debts hard to pay now will be paid easily.

Farm solvency will be restored, and farm owners will keep their farms. It would be a loss to the Federal land banks, as well as to the farmers, if circumstances compelled a drastic foreclosure policy. Fortunately that is not the case.

Crops of the Year

On an acreage slightly greater than that of 1931, but smaller than that of 1930 and 1929, the composite yield of all field crops in the United States this year was about 6 per cent less than that of 1931. It was 4 per cent below the average for the 5-year period 1924–1928.

This period will be used as the basis of production comparisons throughout this brief crop survey, except in the case of cotton. It excludes the drought year 1930, which abnormally lowers the averages for the period 1926–1930. Cotton production is compared with the average for the period 1926–1930 because cotton, a crop extremely tolerant of drought, did not suffer as much as other field crops in 1930.

Acreages of the cash crops declined greatly this year. Acreages of feed crops increased. The area seeded to winter wheat in 1931 was 8 per cent less than in 1930, and winter abandonment was large. Feed crops partly replaced abandoned winter wheat. In the Northwest favorable moisture conditions impelled the farmers to plant full acreages of wheat and feed grains. An increased acreage of spring wheat offset the reduction in the winter-wheat acreage. The barley acreage exceeded that of 1931 by 22 per cent, and was the largest ever sown. Corn acreage, the second largest on record, was 3.3 per cent above that of 1931. Oat acreage was 5.7 per cent larger than that of 1931, and about equal to the 5-year average. Tobacco acreage was reduced 29 per cent from 1931, cotton acreage 9.5 per cent, bean acreage 21 per cent, and rice acreage 13 per cent. Broadly, these drastic readjustments reflected the influence of low prices in the cash-crop markets and the relatively greater worth of feed crops. The acreage of potatoes, however, increased 1 per cent and that of sweetpotatoes 12 per cent. Acreage planted to vegetable crops for canning was greatly curtailed.

Wheat production was extremely short. Winter and spring crops combined totalled 712,000,000 bushels—14 per cent below the 5-year average. The winter-wheat crop was 442,000,000 bushels, or 20 per cent below the average. Spring-wheat output totaled 270,000,000 bushels, or 4 per cent below the average. The rye crop was 42,500,000 bushels, or 1,600,000 bushels below the 5-year average. Rice production was 37,700,000 bushels, or about 1,000,000 bushels below the average. Buckwheat production was 7,100,000 bushels, or 4,700,000 bushels below the average. The bean crop of 10,200,000 bags (100 pounds each) is just below the average. Harvested peanut production, at 1,019,000,000 pounds, was one-third above the average.

Cotton production was estimated in October at 11,425,000 bales. This was only two-thirds as large as the 1931 crop and 23 per cent below the average for the five years 1926–1930. Flaxseed production totaled 13,000,000 bushels, 10,000,000 bushels below the 5-year (1924–1928) average. This crop was seeded on a greatly reduced acreage and suffered from dry weather.

Corn production was 2,885,000,000 bushels, or 10 per cent above the 1924–1928 average. Increased acreage accounted for the increased production. The yield per acre was slightly below the 1919–1928 average. Oat production was 1,265,000,000 bushels, as com-

pared with the 5-year average of 1,277,000,000 bushels. The barley crop, grown as already noted on a greatly increased acreage, was 313,000,000 bushels, or 43 per cent above the 5-year average. Grain-sorghum production, at 116,000,000 bushels, was 18 per cent above the average. Hay production, short for the third consecutive year, was only 79,900,000 tons, as compared with the 5-year average of 85,800,000 tons. By-product feeds, such as cottonseed meal, flaxseed meal, and wheat offal, were all short this year. Pastures were materially below the average.

The tobacco crop, at 1,012,000,000 pounds, was only five-eighths as large as in 1931 and 287,000,000 pounds below the 5-year average. The greatest reduction was in the flue-cured type. Light air-cured tobacco, largely burley, was above the average crop.

Apple production was one-fourth below the 5-year average and peach production one-fifth below it. Grape production was 9 per cent below the average and pear production 3 per cent above it. The orange and grapefruit crops were above the average, though smaller than in 1931. The dry-prune crop was slightly above the 5-year average and the fresh-prune crop nearly double the average.

The potato crop, at 357,000,000 bushels, was 19,000,000 bushels less than in 1931 and 4,000,000 bushels less than the 5-year average. Sweetpotato production was 74,600,000 bushels, one of the largest crops ever produced.

Livestock, Dairy, Poultry

Meat supplies from livestock slaughtered under Federal inspection during the first eight months of 1932 were about 2 per cent smaller than in the corresponding months of 1931. Farm and retail slaughter, however, increased. Hence, the total supply was about the same as in the previous year. Slaughter of cattle and calves declined about 5 per cent. Cattlemen withheld cows and heifers from the market in large numbers, and the number of cattle on farms increased. Federally inspected slaughter of hogs was 7 per cent larger in the marketing year ended September 30, 1932, than in the preceding year, but the average weight of the animals was less. Slaughter supplies of lambs in the marketing year ended April 30 set a record. The number of sheep in the United States at the beginning of the year was likewise at a record height. Winter losses of ewes were heavy in the Western States, however, and the 1932 lamb crop was 8 per cent smaller than that of 1931.

Declining demand compelled livestock producers to move their animals at drastic price reductions. In the first eight months of the year the average price of slaughter cattle was $5.17 a hundred pounds, as compared with $6.53 in the corresponding period of 1931 and a 5-year (1927–1931) average of $9.22. Hogs slaughtered under Federal inspection in the year ended September 30, 1932, brought an average price of only $4.05 a hundred pounds, as compared with an average of $7.21 in the previous year and a 5-year (1927–1931) average of $9.35. The average price paid for sheep and lambs slaughtered under Federal inspection in the first eight months of 1932 was $5.87 per hundred pounds, as compared with $7.72 in the corresponding period of the previous year and a 5-year (1927–1931) average of $11.54. Payments by slaughterers operating under Federal inspection were about 35 per cent less in the first eight months of 1932 than in the corresponding period of 1931 and 61 per cent less than similar payments in the first eight months of 1929.

The 1932 wool clip was about 7 per cent smaller than the record clip of 1931. Wool production in other important wool-producing countries, however, remained high, and wool prices in the first half of 1932 fell to low levels. As the year advanced the demand strengthened, and wool prices recovered encouragingly.

In the eight months ended August 31, 1932, the production of butter, cheese, condensed milk, and evaporated milk in the United States was approximately 1.1 per cent less than in the corresponding period of 1931. This small decrease resulted from light feeding and unfavorable pasture conditions in many States. The number of milk cows on farms increased, as it has done steadily since 1928. The increase in 1931 was between 3 and 4 per cent, the largest in 30 years. Though milk production, owing mainly to the condition of pastures, has not kept pace during the last three years with the increase in the number of milk cows, it has run ahead of demand. There was a decrease of approximately 3.7 per cent in the consumption of butter, cheese, condensed milk, and evaporated milk in the United States from January 1 to August 31, 1932, as compared with the consumption in the corresponding period of the previous year. Prices dropped proportionately far more than consumption. Dairy-product prices at the farm in the first eight months of 1932 were 24 per cent lower than in the first eight months of 1931.

Production of eggs on farms was about 3.2 per cent less in the first half of 1932 than in the first half of 1931. It was about 2.6 per cent less than the 5-year average for the same months during the years 1926–1930. Commercial-flock production, in the aggregate, did not decline proportionately as much. Commercial flocks were smaller and less numerous in the far West, but larger and more numerous in the North Atlantic States. Receipts of eggs at four principal markets during the first half of the year were 19.6 per cent less than in the corresponding period of the previous year and 17.6 per cent below the 5-year average. Egg prices advanced sharply during the summer and early fall. Poultry prices, on the other hand, did not improve materially. Hatchings this year were later than those of 1931 and produced a larger supply of broilers for late summer marketing. Young chickens in farm flocks on July 1 were 7 per cent more numerous than on the same date last year, and about equal to the average for the five years 1926–1930. Commercial hatcheries also produced a somewhat larger number of chicks.

More complete details of farm production, prices, and income appear in the part of the Yearbook devoted to agricultural statistics.

Agricultural Exports and Imports

Exports of the principal agricultural products from the United States in the fiscal year 1931–32 declined in value 28 per cent from those of the preceding year, 50 per cent from those of 1929–30, and 59 per cent from those of 1928–29. This 3-year decline followed a 7-year period of relative stability in exports. In this 7-year period the value of the exports was lower than it was during the war and immediately after, but higher than it was before the war. The decline during 1931–32 carried the value of the principal agricultural exports down to about the level at the beginning of the century.

Part of the decline reflected the price slump. But the exports dropped heavily in volume as well as in value. In volume the agri-

cultural exports in 1930–31 were lower than in any other year since 1909–10. There was an increase in 1931–32, which made the total slightly greater than that of 1929–30. Only about 7.4 per cent of our agricultural production was exported in 1930–31, and about the same percentage in 1931–32. This ratio, the lowest since the war, compares with 12.2 per cent in 1928–29 and 10.2 per cent in 1929–30.

Exports of all the more important agricultural commodities, except cotton and wheat, declined in 1931–32. Exports of leaf tobacco dropped 27 per cent in volume from the level of the preceding year. Exports of meat and meat products dropped 27 per cent. Exports of barreled apples increased, but exports of nearly all other fruits decreased.

Cotton exports advanced 27 per cent—from 7,180,000 bales of 500 pounds (including linters) in 1930–31 to 9,131,000 bales in 1931–32. An increased demand in the Orient, the result of a short crop in India, accounted principally for the gain. Exports of cottonseed oil increased from 26,353,000 pounds in 1930–31 to 41,038,000 pounds in 1931–32. Exports of wheat, including flour, increased slightly from 131,475,000 bushels in 1930–31 to 135,797,000 bushels in 1931–32.

Imports of principal agricultural products (excluding forest products and rubber) decreased in both volume and value. The value of these imports totaled $1,066,942,000 in 1930–31 and $783,475,000 in 1931–32, a decline of 28 per cent. The principal decreases in volume were in imports of wool, 31 per cent; oil cake and oil meal, 24 per cent; palm oil, 30 per cent; and copra, 21 per cent. Imports of flaxseed increased 77 per cent. Imports of silk, coconuts, and coffee declined slightly and those of olive oil increased slightly.

DEPARTMENT EXPENDITURES AND INCOME

This year, perhaps more than ever before, the need for plain speaking on public expenditures is imperative. Because incomes have dropped and taxes have not, public interest in Government expenditures is at a high pitch. Every public institution, no matter how essential its activities or how lofty its objectives, is to-day on trial. Though our agricultural institutions have a long and honorable history, they are not exempt from current criticism. They, too, cost money.

Accordingly it becomes a duty and a necessity for every public institution to spread before the public not only the customary statistical statement of its expenditures, but also a simple, intelligible statement of how it spends its money, and what return the public gets on the investment. I propose to do that for the Department of Agriculture in the remainder of this annual report. No attempt to propagandize will be made. The effort will be to set forth unvarnished facts. The pages immediately following explain how the investment is made; subsequent sections of the report describe specifically, if incompletely, the return on the investment during the past year.

The expenditures and obligations[1] of the Department of Agriculture for the fiscal year ended June 30, 1932, amounted to more than

[1] The figure "expenditures and obligations," used by the Department of Agriculture for many years in its financial statements, differs from the annual Treasury statement of cash withdrawals. "Expenditures and obligations" covers all money obligated in the current fiscal year, even though some of the money may not be paid out until after the close of the year. This figure is sometimes several million dollars above or below the Treasury statement of cash withdrawals. It should also be remarked that neither the word "expended" nor the word "obligated" is a synonym for the word "appropriated." These words, and the figures they represent, can not be used interchangeably.

$300,000,000—specifically, to $306,400,098. This is a vast sum of money. How was it spent? Was it all for agriculture? How much of it went for research, for law enforcement, for services of one kind or another? Why has this total mounted, during the fiscal years 1931 and 1932, to double the average of the preceding eight years? These are fair questions.

First, take the 1932 total apart (Table 1) and see what it is made of:

TABLE 1.—*Expenditures and obligations of the United States Department of Agriculture for the fiscal year 1932*

Item	Amount	Percentage of total
(1) Road construction (including $188,660,236 paid to the States for Federal-aid highways)	$212,421,775	69.33
(2) Emergency relief loans	10,806,829	3.53
(3) Payments to States for support of agricultural experiment stations, extension work, and cooperative forestry activities, including fire prevention	16,040,465	5.23
(4) Ordinary activities	67,131,029	21.91
(a) Of general public interest, $36,372,082 (11.87 per cent).		
(b) Primarily for agriculture. $30,758,947 (10.04 per cent).		
(5) Total, Department of Agriculture, all purposes	306,400,098	100.00

Even a casual study of these figures will disclose certain important facts. I call your attention to three:

(1) Over four-fifths (81 per cent) of the 1932 expenditures of the Department of Agriculture went to the general public, rather than to agriculture. (Items 1 and 4 (*a*).)

(2) Of every dollar expended by the department, only 10 cents was spent or could be spent on the ordinary agricultural activities of the department. (Item 4 (*b*).)

(3) More than two-thirds (67 per cent) of the total was allocated to the States ($188,660,236 of item 1 and all of item 3). The department served merely as the channel through which the money passed from Congress to the States, though it shared with the States the responsibility for supervising the expenditures.

It is also apparent that the size of the department's expenditures in 1932, as in 1931, is a direct reflection of the efforts of Congress and the administration to bolster employment in a period of extreme economic distress. Expenditures of $300,000,000 a year are not normal for the Department of Agriculture. The normal total during 8 of the past 10 years has ranged between $125,000,000 and $180,000,000, including road funds.

Two major types of emergency treatment were held necessary during the last two fiscal years. One was to put more men to work building roads. The other was to loan money direct to farmers suffering from drought, flood, and unprecedented economic distress. The Department of Agriculture was therefore authorized to spend more than $200,000,000 on roads in 1932, as contrasted with expenditures of approximately $90,000,000 annually in the years 1923–1930. The department was also ordered to loan to farmers nearly $50,000,000 in 1931, and more than $10,000,000 in 1932. Roads and loans, therefore, account for most of the increase in the expenditures of this department.

Ordinary Activities for "General Advantage"

Once payments to the States (item 3, Table 1) and emergency expenditures for roads and relief loans (items 1 and 2) are segregated, it becomes a simpler matter to examine the ordinary activities and expenditures of the Department of Agriculture. These include the research, service, and regulatory activities that have been going on for many years. Later on in this report, in the sections describing recent results of our research, service, and regulatory activities, the reader may find material which will help him to pass judgment on the results and continuing value of these activities.

The ordinary activities of the department required in the fiscal year 1932 an expenditure of $67,131,029. That sum is about a fifth of the department's total expenditures and about 1⅓ per cent of the total 1932 expenditures of the entire Federal Government.

These ordinary activities include, in the first place, the enforcement of some 50 regulatory laws. There is likewise a long list of other legislative acts requiring special research and services. More than a score of these laws have been enacted within the past 10 or 12 years. There are the grain futures act, the packers and stockyards act, the produce agency act, the cotton statistics act, the perishable agricultural commodities act, the air commerce act, etc. To carry out the intent of Congress as specified in these laws requires trained personnel and equipment, and trained personnel and equipment require money. Considering only the score of laws enacted within the past dozen years, their enforcement required more than $17,000,000 of the department's 1932 expenditures for ordinary activities.

Of most importance, however, is the solid fact that through its ordinary activities the Department of Agriculture serves every citizen in the land, regardless of his occupation. It is only nominally the farmers' branch of the Federal Government. It was recommended by Lincoln for "general advantage." It has existed with general advantage ever since.

The department deals fundamentally with the food supply—how to produce it, where to produce it, how to protect it, how to keep it healthful, how to pack it, how, where, and when to sell it. The department has been charged with a wide and inclusive group of services that are not limited to agricultural implications. These range from the daily weather reports, food and drug regulation, nutritional research, commodity standardization and inspection, to the building of highways used by all the people, and the control and conservation of the national forests which are the property of all citizens jointly.

It requires no intimate understanding of the work of the Weather Bureau to recognize that its activities are clearly of general public interest. The daily weather reports on page 1 of every newspaper are a reminder. The bureau's flood and storm warnings, its forecasts and observations on land, on sea, and in the air, are further evidence. Shipping could not do without the services of the Weather Bureau, nor could aviation. Cities on the coast subject to hurricanes or on rivers subject to flood anxiously watch Weather Bureau reports on the probable path of a hurricane, or the rise of a river, and prepare themselves accordingly. Farmers, contractors, and other business men observe frost warnings, forecasts of rain or snow, of heat waves or cold waves. The service of the Weather Bureau goes to all the people, day in, day out.

That the general public has a stake in the national forests should require no proof at this late date. To protect and maintain the 161,360,691 acres in the national forests is the task of the Forest Service of the Department of Agriculture. Our forests constitute a natural resource of immeasurable value, not simply for their timber, but perhaps even more for their beneficial influence on soil conservation, watershed protection, and climate, and for their constantly increasing use for recreation and game conservation. By the same token the work of the Biological Survey, in acquiring and maintaining game preserves, in research designed to help protect beneficial wild life and to eradicate or control injurious wild life, likewise serves the general public, rather than any one segment of the public.

I have said one function of this department is to assure the healthfulness of the food supply of the Nation. Enforcement of the pure food and drug laws at once comes to mind. At a cost of about 1 cent per capita, the Food and Drug Administration protects the public against adulterated products, guarantees that a package will contain what the label says it contains, and in so doing serves consumers, processors, and producers.

Protection of the consumer's meat supply, through the activities of the Bureau of Animal Industry, comes under the same general head. Meat inspection, conducted at some 800 establishments in 250 towns and cities, insures that the Nation's meat supply is free from disease and that every step of the slaughtering and shipping in those establishments is conducted according to the best principles of sanitation. The average cost of this inspection is between 6 and 7 cents per animal. The campaign to eradicate bovine tuberculosis from cattle is of immediate concern to milk consumers, particularly children. Begun in 1917, this campaign thus far has reduced the estimated prevalence of tuberculosis in cattle from more than 4 per cent to about 1.4 per cent.

Ordinary Agricultural Expenditures Take 10 Per Cent

These activities—weather service, forest and game conservation, and maintenance of the healthfulness of the food supply—absorb more than half the ordinary expenditures of the department. To be exact, in the fiscal year 1932 they absorbed $36,372,082. Many smaller items—certain research projects in human nutrition in the Bureau of Chemistry and Soils and in the Bureau of Home Economics, entomological services to householders and city gardeners, and a long list of others—might logically be added to this list. They would swell the total of expenditures in this classification by another $2,000,000 or $3,000,000. But the relationship of the department to the welfare of the general public should be apparent from what has already been said.

The remaining ordinary expenditures, $30,758,947—amounting to *10 per cent of the total expenditures of the department, about 0.5 per cent of the total expenditures of the Federal Government*—are in purpose primarily agricultural. In effect, they are of as much concern to industry, to commerce, and to the general public as to agriculture.

Thus the fertilizer industry and the national defense share with agriculture the benefits of the department's part in making cheap nitrogen from the air. The textile industry, retailers, and consumers, as well as the cotton farmer, have an interest in new uses developed for cotton. The paint trade, as well as the farmer, awaits the results

of research on the wilt disease of flax. The tanning, furniture, and upholstery industries, as well as the stockman and the lumberman, have an interest in the effort to establish blight-resistant chestnut trees. Go down the list of the department's research and service activities—in plant and animal breeding; veterinary medicine; defense against insects, parasites, and diseases; chemical research related to farm products; fertilizer studies; the fundamental chemistry, physics, and bacteriology of the soil; collection and dissemination of agricultural statistics, and their interpretation—in all these, and in others too numerous to list here, there is a vital element of public interest. Agriculture could not, even if it would, restrict the results of these research and service activities to the farm.

The criticism is sometimes made that Government engages in too many activities, that it interferes with the rights and privileges of the individual. That criticism is frequently justified. I doubt if it applies to much of the work of this department. No reasonable person would consider the building of highways, protection of the forests, protection of the food supply, the service of the Weather Bureau unnecessary or improperly in conflict with individual rights. In general, the guiding principle of this department, as elaborated in many legislative acts, is to undertake tasks which the individual can not do for himself, to do necessary things which would otherwise not be done.

Most of the services of the department are worth more than they cost. Congress ordered them and Congress will cancel the order if there is reasonable objection and real evidence that a service is not worth the tax burden it causes. In these days every public institution should be ready not only to spread before the public the unvarnished facts of its expenditures, but should also be ready to accept gracefully whatever economies or curtailments are necessary. This department is ready to do so. The real question is whether any particular service, such as road building or meat inspection, is necessary in an economic emergency. If there is any item not justified by its service value to the Nation as a whole, it should be cut off the program. But as the basis for judgment let us use the facts and all the facts.

The tabular matter that follows presents the facts about the expenditures of the Department of Agriculture for the fiscal year 1932, classified by types of activity and by organization units, and gives details on payments to States and road expenditures. The tabulation on page 20 gives the income from department activities, which during 1932 amounted to $23,512,317, not including the value of collateral against loans, valued at $12,175,239. This total, $35,687,556, subtracted from the gross expenditures and obligations of $306,400,098, leaves the net expenditures and obligations of $270,712,542.

Expenditures and Obligations

Expenses incurred under appropriations administered by the Department of Agriculture for activities prosecuted during the fiscal year ended June 30, 1932, including road-construction work and emergency relief loans, totaled $306,400,098. Of this amount $300,026,509 was disbursed within the fiscal year, leaving $6,373,589 in obligations created during the year unpaid on June 30, 1932.[2] The total of $306,400,098 expended and obligated for activities conducted during the fiscal year 1932 was distributed by types of activity and by organization units as indicated in Tables 2 and 3.

TABLE 2.—*Expenditures and obligations classified by types of activity*

Type of activity	General activities		Payments to States (exclusive of Federal-aid road funds)	Road construction funds	Emergency relief loans	Total	
	Amount	Per cent				Amount	Per cent
Research	$17,718,049	[a] 26.4	[b] $4,357,000	[c] $488,814		$22,563,863	7.4
Extension	2,540,118	3.8	[d] 8,662,466			11,202,584	3.6
Eradication or control of crop and animal pests	12,118,145	18.0				12,118,145	4.0
Regulatory work	11,996,034	17.9				11,996,034	3.9
Public-service activities	22,758,683	33.9	[e] 3,020,999	[f] 76,135	[g] $10,806,829	36,662,646	12.0
Road construction			([h])	211,856,826		211,856,826	69.1
Total	67,131,029	100.0	[i] 16,040,465	[j] 212,421,775	10,806,829	[k] 306,400,098	100.0
Percentage of grand total	21.9		5.2	69.3	3.6	100.0	

[a] 5.8 per cent of grand total.
[b] Payments to State agricultural experiment stations and to Hawaii and Alaska under Hatch, Adams, and Purnell Acts.
[c] Highway research paid from appropriation for Federal-aid highway system.
[d] Payments to State agricultural colleges and to Hawaii and Alaska under Smith-Lever, Capper-Ketcham, and supplemental acts.
[e] Forest Service items; see statement "Payments to States and road expenditures," p. 18.
[f] Highway service activities paid from appropriation for Federal-aid highway system.
[g] Includes $10,695,591 for loans to farmers in drought and storm stricken areas and for agricultural credits and rehabilitation loans, and $111,238 for collection of loans.
[h] $188,660,236 paid to States for Federal-aid roads included under column "Road construction funds."
[i] See statement "Payments to States and road expenditures."
[j] Includes $16,189,381 for forest roads and trails, $194,036,244 for Federal-aid highways (including $188,660,236 paid to States), and $2,196,150 for Mount Vernon Memorial Highway. (See statement "Payments to States and road expenditures.")
[k] Includes $72,545,965 paid from emergency appropriations ($61,850,374 for road construction and $10,695,591 for relief loans).

[2] In addition to the $300,026,509 in payment of obligations for current work, $5,647,364 was disbursed during the year on account of outstanding obligations incurred in the fiscal years 1931 and 1930, making a total of $305,673,873 in checks issued during 1932. Adding to this amount $13,301,944 in checks issued during the preceding fiscal year but cashed by the Treasurer of the United States in 1932 brings the total of checks paid during 1932 to $318,975,817, as shown in Budget Statement No. 2 (contained in the general Federal Budget, volume dated 1934) and in the statement of classified receipts and expenditures of the Government for the period from July 1, 1931, to June 30, 1932, issued by the Treasury Department on July 15, 1932.

TABLE 3.—*Expenditures and obligations classified by organization units*

Organization unit	General activities	Payments to States (exclusive of Federal-aid road funds)	Road construction	Emergency relief loans	Total
Office of the Secretary	[1] $1, 227, 044				$1, 227, 044
Office of Information	[2] 1, 404, 207				1, 404, 207
Library	110, 116				110, 116
Office of Experiment Stations	370, 283	$4, 357, 000			4, 727, 283
Extension Service	[3] 1, 708, 734	8, 662, 466			10, 371, 200
Weather Bureau	4, 140, 941				4, 140, 941
Bureau of Animal Industry	[4] 15, 272, 021				15, 272, 021
Bureau of Dairy Industry	743, 189				743, 189
Bureau of Plant Industry	5, 573, 323				5, 573, 323
Forest Service	[5] 17, 114, 943	3, 030, 999	$16, 180, 381		36, 325, 323
Bureau of Chemistry and Soils	1, 909, 749				1, 909, 749
Bureau of Entomology	2, 484, 676				2, 484, 676
Bureau of Biological Survey	[6] 1, 903, 591				1, 903, 591
Bureau of Public Roads	[7] 209, 225	([8])	196, 232, 394		196, 441, 619
Bureau of Agricultural Engineering	613, 990				613, 990
Bureau of Agricultural Economics	6, 826, 180				6, 826, 180
Bureau of Home Economics	236, 452				236, 452
Plant Quarantine and Control Administration	3, 383, 563				3, 383, 563
Grain Futures Administration	193, 941				193, 941
Food and Drug Administration	1, 704, 861				1, 704, 861
Farmers' Seed Loan Office				[9] $10, 806, 829	10, 806, 829
Total	67, 131, 029	[10] 16, 040, 465	[10] 212, 421, 775	10, 806, 829	[11] 306, 400, 098

[1] Expenditures listed under Office of the Secretary include the offices of Secretary and Assistant Secretary and general supervisory officials such as the Directors of Scientific, Regulatory, and Extension Work, and the Director of Personnel and Business Administration; including the following organization units which serve the department as a whole: Divisions of Appointments, Organization and Classification, Budget and Finance, Accounts and Disbursements, and Purchase, Sales, and Traffic; mails and files, telephone and telegraph, post office, building guarding, cleaning, and maintenance, elevator operation, mechanical shops, power plant, motor transport, rent in the District of Columbia, and the cost of the Office of the Solicitor, which handles the legal work of the department.

[2] Includes $987,000 for the job printing, publication, and binding requirements of the entire department.

[3] Includes $942,817 contributed from department funds toward salaries of extension agents in the field, supplementing direct Federal-aid payments to States under the Smith-Lever, Capper-Ketcham, and other extension acts.

[4] Of this amount, $5,946,605 was expended for tuberculosis eradication, including indemnities paid to livestock owners on account of animals destroyed, and $5,561,141 was for meat inspection.

[5] Includes $1,700,000 for acquisition of forest lands and $640,869 for construction of Forest Products Laboratory building.

[6] Includes $324,711 for purchase of land.

[7] Includes $192,749 for construction of a building at Alameda, Calif.

[8] $188,660,236 paid to States for Federal-aid road work, included under column "Road construction."

[9] Includes $10,695,591 for loans to farmers in drought and storm stricken areas and for agricultural credits and rehabilitation loans, and $111,238 for collection of loans.

[10] See statement "Payments to States and road expenditures," which follows.

[11] Includes $72,545,965 paid from emergency appropriations ($61,850,374 for road construction and $10,695,591 for relief loans).

Payments to States and Road Expenditures

(Analysis of "Payments to States" and "Road construction" included under Tables 2 and 3)

PAYMENTS TO STATES (EXCLUSIVE OF FEDERAL-AID ROAD FUNDS)

Office of Experiment Stations:	
Payments to State agricultural experiment stations and to Hawaii and Alaska for research under Hatch, Adams, and Purnell Acts	$4, 357, 000
Extension Service:	
Payments to State agricultural colleges and to Hawaii and Alaska for extension work under Smith-Lever, Capper-Ketcham, and supplemental acts	8, 662, 466

Forest Service:			
(*a*) Payments to States under Clarke-McNary Act—			
Cooperative protection of State and private timberlands against fire (exclusive of $63,700 for forest taxation and timber insurance studies, included under "General activities" in Tables 2 and 3)		$1, 654, 576	
Cooperative distribution of forest planting stock		94, 930	
(*b*) Payments to States and Territories from national-forest receipts for benefit of county roads and schools		1, 271, 493	
			$3, 020, 999
Total payments to States, exclusive of Federal-aid road funds			16, 040, 465

ROAD CONSTRUCTION

(1) Forest roads and trails (Forest Service):			
Federal highway act funds		$12, 286, 214	
Appropriations for "General expenses"		1, 684, 200	
"Cooperative work" fund		1, 718, 674	
National-forest receipts fund ("Roads and trails for States")		500, 293	
			$16, 189, 381
(2) Federal-aid highways (Bureau of Public Roads):			
(*a*) Under Federal highway act funds—			
Normal program—			
Administrative expenses	$1, 873, 118		
Highway research and service activities	564, 949		
Payments to States	[3] 127, 367, 120		
		129, 805, 187	
Special payments to States for restoration of flood-damaged roads and bridges—			
Alabama	50, 954		
Florida	78, 926		
Georgia and South Carolina	1, 257, 412		
Missouri, Mississippi, Louisiana, and Arkansas	805, 670		
Vermont, New Hampshire, and Kentucky	187, 721		
		[3] 2, 380, 683	
		132, 185, 870	
(*b*) Under emergency construction act of December 20, 1930—			
Payments (advances) to States	[3] 58, 912, 433		
Cooperation with States and Interior Department in construction of public-land highways	2, 937, 941		
		61, 850, 374	
Total, Federal-aid highways			194, 036, 244
(3) Mount Vernon Memorial Highway (Bureau of Public Roads)			2, 196, 150
Total, road construction			212, 421, 775

[3] Total paid to States for Federal-aid highways, $188,660,236.

Income from Department's Activities

Incident to the department's work during the fiscal year 1932, receipts totaling $23,411,476 were paid into the Treasury, and fines were imposed and judgments recovered by the courts in connection with the enforcement of regulatory laws amounting to $100,841, as follows:

Receipts:		
(1) Deposited to credit of miscellaneous receipts fund—		
From business on the national forests	$2, 294, 247	
Contributions from private cooperators, appropriated as a special fund ("Cooperative work, Forest Service") for road and trail construction, fire prevention and suppression, brush disposal, and investigative work on national-forest and privately owned lands	2, 125, 245	
From other sources	2, 146, 483	
		$6, 565, 975
(2) Fees collected for classifying cotton, deposited to credit of revolving fund for conducting that work		48, 421
(3) Seed and other loan collections		[4] 16, 182, 148
(4) Reimbursement to various department appropriations for expenditures made therefrom		614, 932
Total receipts		23, 411, 476
Fines: Fines imposed and judgments recovered by the courts in connection with violations of statutes intrusted to department for enforcement		100, 841
Total income from activities of Department of Agriculture		23, 512, 317

Savings in 1932

The foregoing statistics do not reveal the fact that during the fiscal year 1932 permanent savings of $4,665,200 were made in conducting the ordinary activities of the department and will be covered into the general Treasury. In addition, unexpended balances of approximately $7,902,000 accrued on special appropriations for loans, roads, etc., will also be returned to the Treasury.

The savings in expenditures for ordinary activities were made possible by reducing pay roll, travel, and supply expenses, by curtailing and postponing activities, and by readjusting the program of work both in Washington and at the field stations of the department. To make such savings required an earnest and conscientious effort by the whole staff of the department, an effort that was promptly forthcoming in view of the general financial situation of both the Federal Government and the taxpayer. Economizing in this manner, it should be made plain, is not a simple task, for similar efforts at economizing have already been made each year by the department, by the Bureau of the Budget, and by the Appropriation Committees of the House and Senate. Every item in an appropriation bill is subjected to exacting scrutiny by all these agencies before the funds are made available.

[4] In addition, there was deposited and held by the department at the close of the fiscal year collateral against loans, valued at $12,175,239.

Appropriations and Savings, 1933

The 1932 savings in almost every case were continued over into 1933 in the form of reduced appropriations, and constituted about one-half of the $10,000,000 reduction in the 1933 appropriations for the ordinary activities of the department. Under the economy act the amount which the department can spend for paper and for printing and binding has been reduced by approximately 40 per cent, or to $340,000 less than in 1932. Because of the economy act and the reduced appropriations, the pay-roll expenditures of the department for 1933 will be reduced, it is estimated, by more than $5,000,000. In addition, vacancies are being left unfilled wherever possible, and 166 superannuated employees were retired from the service in the first two months of the current fiscal year, making possible further savings of more than $1,000,000. The money saved by the compulsory furlough and through vacancies left unfilled is impounded and returned to the Treasury.

The regular appropriation act for the fiscal year 1933, together with so-called permanent appropriations, made $185,883,236 available for the work of this department for the year ending June 30, 1933. This is a decrease of 38.3 per cent below the appropriations charged to 1932. After the enactment of the regular agricultural appropriation bill, however, Congress passed the emergency relief and construction act, by which an additional $132,000,000 was made available through the Department of Agriculture for road construction, including $120,000,000 for advances to the States for this purpose. This money was provided for the relief of unemployment. Including these emergency funds, the total available for the fiscal year 1933 for the Department of Agriculture is $317,883,236.

Though this emergency legislation has greatly increased the funds for road construction, the funds for all other Department of Agriculture activities during 1933 have been materially reduced. Comparing 1933 appropriations with those for 1932, we find that relief loans are no longer a factor in 1933, that payments to States (exclusive of road funds) are nearly a half million dollars less than in 1932, and that appropriations for the ordinary activities of the department are smaller than the 1932 total by $10,122,694, a decrease of 14.4 per cent.

AGRICULTURAL RESEARCH

The basic task of this department is scientific research. All its other duties, such as extension and information work, eradication and control of plant and animal diseases and pests, weather and crop reporting, forest and wild-life administration, regulatory-law administration, and even road construction, rest upon research. Without research the department could not carry out the public functions delegated to it by Congress. The department's research projects are correlated with those of the State experiment stations and other research agencies. This prevents duplication.

This annual report can, as usual, show only a small part of the more important scientific achievements of the past fiscal year. These selected examples show how the results of research aid American agriculture to (1) reduce costs of production, (2) widen markets and

reduce wastes in distribution, (3) discover new uses for farm products and by-products, (4) adjust production to demand, and (5) improve the quality of farm products. The underlying purpose of all these is to raise family living standards.

The department does not conduct research merely to gain knowledge that may or may not be useful. It employs research to guide action in tasks imposed upon it by Congress in response to keenly felt agricultural and national needs. Research is a dividend-paying investment. This is realized by manufacturers, as is shown by the first results of a survey recently started by the National Research Council, covering 1,600 industrial-research laboratories. In July the council had received 350 replies to a questionnaire. Though 71 per cent of the reporting companies did less business in 1931 than in 1929, 50 per cent of them spent more on research. Seventy-four per cent spent a larger proportion of their sales income on research in 1931 than they did in 1929. Only 6½ per cent spent a smaller percentage. Research has become an industrial necessity.

Science Increasingly Important To-day

It is frequently said that agricultural research is not required at present because it tends to stimulate agricultural production. In the face of existing surpluses, the country needs not more but less agricultural production; therefore, it is argued, it needs not more but less agricultural research. This faulty logic has attracted wide attention.

Farmers certainly should reduce production when markets are oversupplied. It does not follow that it makes no difference how they reduce production. On the contrary, the method is all important. It does not help to reduce supplies through means that increase the costs of production. Profits in agriculture, as in other industries, depend on the margin between prices and production costs. When the volume of production is reduced by using inefficient production methods, costs may rise more than prices. This happens if agriculture neglects science. Without scientific practices the farmer calls upon the destructiveness of diseases and pests to regulate the output. Pests may remove the surplus, but they will not do so to the farmer's profit.

The right remedy is far different. When it is necessary to reduce production, the reduction must be made by means which do not increase net costs. There is no profit in sacrificing efficiency. Agriculture should economize in land and labor, not in the use of improved practices. This calls for organization and for collective as well as individual action. Collectively, through their own organizations, farmers must control the total volume of production. Individually, they must increase efficiency to the greatest possible extent. Scientific methods have to do with the cost of production, and do not determine the volume of production. Scientific methods lead to greater production per acre, at lower cost, and do not necessarily result in more acres and greater volume. Science can not regulate the size of the plant; it can and does help reduce the operating cost of the plant. In farming as in other industries science is more necessary when prices fall than when prices rise, because the cost of production becomes increasingly important.

Does Not Guarantee Profits

Agricultural research is not in itself a guaranty of farm profits. The reason is obvious. Research is only one of the factors that determine the profitableness of agriculture or, in times of stress, make it less unprofitable than it otherwise would be. Total supply is a big factor. Profits depend also on obscure influences on demand. Among these are unforeseen events in world business, credit, and political affairs. While science is only one element in farm prosperity, it is an indispensable element. The eventual improvement in the market situation and in rise in prices will not in themselves suffice to restore prosperity to agriculture. Farmers must hold fast to science as a means of keeping down their costs of producing commodities which markets will accept, if they expect to share in the economic recovery when it comes. This is particularly true of farmers who produce for export. Such farmers can not afford to decrease their efficiency in the expectation that farmers of other nations will follow suit. World competition can not be overcome in that way. It is better to rely on good farm management, cooperative effort, and planned curtailment of the cultivated area where costs are too high.

Helps Balance Supply and Demand

Scientific research for the benefit of agriculture frequently assists in the adjustment of supply to demand. It does this in several ways. One is by its effect on the quality of products. High-quality goods generally command a better and more stable market than do inferior goods.

Science helps to balance supply with demand when it finds new uses for crops or uses for previously unutilized products or by-products. Creation of new products creates new wants, and therefore new markets. It is not easy to increase the total demand for foodstuffs, because the capacity of the stomach is limited, but agriculture does not produce foodstuffs alone. For many of its other products the consumptive demand is elastic, particularly when these products are so processed as to increase their utility. Research thus stimulates consumption.

Not only does science create markets for much that formerly was wasted, but it shows how established markets may be served more profitably. Some years ago this department found that apple scald, a storage disease, may be prevented by packing apples with oiled paper. Before this discovery apples often had to be rushed to market regardless of prices, and gluts of deteriorating fruits were common. The use of oiled paper placed the apple in the class of staple commodities. It immensely widened the distributing area, and increased the returns to the producer.

Increases Dependability of Production

Moreover, science facilitates control of production by increasing the dependability of farm operations. Only dependable production can be controlled. When farming is a sheer gamble, with nature deciding the result, production control is utterly impracticable. Yields one year may be destroyed by insects and pests or by adverse

weather conditions, while the next year the yields may be high, perhaps on an increased acreage. Such fluctuations in production cause corresponding fluctuations in prices, which in turn lead alternately to overplanting and underplanting. The farmer can do little to obviate the resulting gluts and shortages unless he understands the biological phases of production, and develops means to resist plant pests and diseases and unfavorable weather conditions. Each step in that direction is a step also toward production control.

Increases Living Standards

Another important means whereby science increases the demand for goods is by preserving human life and making it richer. It has fostered the growth of populations and has raised standards of living. In the last 200 years the world's population has increased nearly three times as much as it did during many previous centuries. It has almost trebled since 1800. In most civilized countries the gain has been accompanied by an extraordinary increase in average well-being. One evidence of this is the increase in the per capita consumption of the more expensive foods. In western and central Europe, as well as in North America, the per capita consumption of meat, milk, fruit, and fresh vegetables has grown as much as 50 per cent. This growth in population and in well-being is directly attributable to science. Populations sometimes increase more or less independently of scientific progress; in that case living standards fall.

Investigations by this department that help to reduce production costs, eliminate waste, improve the quality of farm products, and facilitate the distribution of agricultural products, contribute directly to raising and maintaining standards of living. Studies of foods and nutrition produce results that are in wide use and demand to-day. They help to maintain the health of our population at minimum cost through wise use of the supplies most readily available in different localities.

Other contributions from investigations by the department bulk large as aids to human health and longevity. Research in the Bureau of Animal Industry from 1888 to 1893 showed that a microorganism found in the blood of cattle causes splenetic fever, and that the disease is transmitted by the cattle tick. This was the first demonstration that a microbial disease can be transmitted by insects. It led to the knowledge that yellow fever, malaria, African sleeping sickness, Rocky Mountain fever, and other maladies are carried through intermediate hosts. That knowledge has saved hundreds of thousands of lives. Again, experiments in the department, which showed that the injection of sterilized cultures or dead bacteria confers immunity to virulent materials, became the basis of vaccine therapy. One resulting triumph was the development of successful inoculation against typhoid fever. Studies of bovine tuberculosis demonstrated that the bovine bacillus may infect human beings, and started nation-wide warfare against tuberculosis in cattle. Other studies developed means of eliminating poisons from canned goods. The department's meat-inspection work is based on means, developed through science, of detecting the presence of harmful elements in meat products. Without scientific means of ascertaining the purity of food and drugs, it would be impossible for the department to

administer the food and drugs act effectively. The public health would suffer. So would the farmer who produces the food.

Only this year department scientists discovered that endemic typhus fever, a debilitating disease of man which has been found in increasing abundance in the eastern and southern part of the country, is transmitted by a mite attacking the tropical rat. This discovery has a far-reaching importance in indicating the way for the ultimate control of the disease.

Another recent discovery is that a small gnat, whose habits have not hitherto been studied, is the cause of pink eye or conjunctivitis, which has become a serious scourge in many parts of the United States, especially among school children. Intensive studies of this problem during the last two years have revealed much of the life history and habits of this pest. The department has developed a flytrap which gives promise of making living conditions much more bearable in localities where these gnats are abundant.

The sand fly, a notorious pest of man and livestock, especially along the Atlantic coast, has recently been under intensive investigation. Sand flies are so small they pass through ordinary window screening. Spraying the marsh lands where they breed with a waste material from creosoting plants is an economical and effective method of destruction devised by the Department of Agriculture.

Saving an Entire Industry

Research in the department has on several occasions saved an entire branch of agriculture. A striking recent example is the restoration of the sugarcane industry in Louisiana, which not many years ago was threatened with extinction by mosaic disease. It had been demonstrated many years previously that resistance to disease and also to climatic conditions is a genetic character that may be bred into or out of plants. Mosaic disease was discovered in 1919 in a small part of the sugarcane area in eastern Louisiana. It spread rapidly through that State and into other sugarcane-growing States. Great areas of cane lands passed out of cultivation, sugar mills remained idle, and the sugarcane industry faced collapse. Mosaic disease can not yet be cured because its exact nature is unknown. Therefore the department undertook to develop resistant varieties of sugarcane. It imported strains known to be tolerant of the mosaic disease. These varieties, propagated from cuttings, were planted in 1928 on 135,000 acres in Louisiana. In 1929 the acreage planted to sugarcane compared favorably with the acreage grown before the appearance of mosaic disease.

RESEARCH THAT REDUCES PRODUCTION COSTS

Research results can not always be classified precisely by their specific uses. Often a discovery does several things at once. It may reduce the farmer's costs of production and at the same time improve the quality of his product and widen his market. On top of all this it may lessen farm wastes. Sprays to control plant pests fill this varied bill. However, it is possible to classify research results roughly according to their most outstanding uses. I shall so classify some of the department's accomplishments during the past fiscal year in order

to indicate their more important applications. The first group is concerned particularly with reducing production costs.

Sugar Beets—Sugarcane

The department has succeeded in developing a curly top resistant variety of sugar beets. This variety, which will be released for general use under the name U. S. No. 1, promises to be extremely valuable where the curly top situation is bad in the Western States. Under curly top conditions in 1931, the new variety produced on the average 4½ tons more beets per acre than did the commercial strains used locally. In quality it fully met commercial standards, while ordinary commercial sugar beets planted under the same conditions proved unprofitable. The new resistant variety produced on the average about 1,600 pounds more sugar per acre than the ordinary variety. It showed marked superiority in tests on 33 representative farms scattered through the curly top districts of California, Idaho, Utah, and Colorado. By the 1934 planting season a considerable supply of the seed of this variety will be available for distribution to sugar-beet growers. The department multiplies the seed rapidly by a recently developed method of overwintering in the field. Other experiments produced sugar-beet varieties highly resistant to leaf spot.

Sugarcane investigations indicated means of decreasing the deterioration of mill cane, of decreasing losses in the recovery of sugar, and of extending the length of the season during which cane may be milled in Louisiana. Study of the adaptation of the variety C. P. 807 confirmed its suitability for culture on heavy clay soils, which had been considered of doubtful value for sugarcane culture. The variety C. P. 807 is valuable for sirup production and is suitable for culture in place of P. O. J. 213, which is increasingly susceptible to red rot. It was distributed widely in Georgia and Alabama.

Rice—Wheat—Oats

In cooperative experiments at the California experiment station, early-maturing hybrid selections of rice produced better yields than the principal early-maturing varieties, Colusa and Onsen, now grown commercially. The California rice industry urgently needs early-maturing, high-yielding varieties. It also needs early-maturing and midseason, medium-grain rices. Investigators have isolated hybrid selections that promise to meet these requirements.

Wheat-breeding investigations produced practical results. Department scientists, cooperating with those of the North Dakota, South Dakota, Minnesota, and Montana experiment stations, found the variety Ceres to be adapted to cultivation throughout a wide area. Farmers grew it this season on about 4,000,000 acres. On the other hand, the recently developed variety Marquillo seemed superior to other varieties in certain areas of Minnesota where rust and lodging occur. The Canadian variety, Reward, promised well in the dry western sections. Under favorable conditions, as under irrigation, the variety Reliance produced the highest yields, but it has a limited adaptation because it is susceptible to rust. In the hard red winter wheat region, the variety Tenmarq, which was developed in cooperative experiments with the Kansas experiment station, showed unusual quality but less winter hardiness than Turkey and Kanred. Ten-

marq is probably limited in adaptation to the area where Blackhull has been most widely grown. Wheat-breeding experiments in the Pacific Northwest emphasize bunt resistance because bunt is serious there. The varieties Ridit and Albit, recently developed at the Washington station, now occupy large areas in that State. In Oregon cooperative experiments produced Oro, another variety highly resistant to bunt; it has been distributed for commercial production.

The Brunker oats, a recently developed variety, demonstrated merit in Colorado and along the northern limits of red-oat production. It resists the types of oat smut that attack the commercial varieties Fulghum and Kanota. It is adapted to sections of the spring-sown red-oat area where farmers need a variety earlier than Fulghum or Kanota. The department has also introduced two promising new varieties, Bond and Kareela, from Australia. Bond is highly resistant to crown rust, the most seriously limiting factor in oat production in the Southern and Southeastern States.

Vegetables—Sweet Corn

A practicable method of controlling celery mosaic in Florida was developed. It requires the eradication of certain wild hosts of the celery mosaic, particularly a form of wandering-jew. Where control measures were practiced, the damage from celery mosaic was less this year than it was last year. In uncontrolled areas it was greater.

The department developed a new early wilt-resistant tomato named Pritchard that appears to rank with Marglobe in excellence and probable future importance. It is large, globular, and scarlet. It is nearly as early as Earliana and bears most of its crop in a short time. Commercial growers obtained seed in sufficient quantities to provide for production of a commercial seed crop this year.

Seed of the Jersey Queen, a newly introduced variety of cabbage resistant to yellows, has been selected from the Early Jersey Wakefield variety. The Jersey Queen has proved highly resistant to yellows under conditions that cause the ordinary Early Jersey Wakefield variety to develop 50 per cent infection.

In recent years in the United States the annual injury to beans from seed-borne diseases has run as high as $4,000,000. In 1931 the department demonstrated that the use in the Eastern States of seed from the Western States will greatly reduce seed-borne diseases. This simple expedient promises to save growers in Maryland alone more than $1,500,000 this year.

Strains of sweet corn resistant to bacterial wilt, a disease that caused severe damage in 1931, were produced in cooperative experiments with the Indiana State Experiment Station. Inbred lines of Golden Bantam produced satisfactory yields under severe epidemic conditions. In fields of commercial Golden Bantam, the percentage of plants destroyed by the wilt ranged from 10.2 to 84.6. The resistant hybrids showed losses of only 1 to 1.1 per cent. Two of the disease-resistant Golden Bantam inbred lines are named Purdue 51 and Purdue Bantam. Their hybrid is called Golden Cross Bantam. Purdue Bantam is uniform, high in quality, highly resistant to bacterial wilt, and higher yielding than most commercial strains of Golden Bantam. Golden Cross Bantam, the hybrid, exceeds Purdue Bantam both in vigor and yield.

Flax—Hops—Tobacco

Two pedigreed varieties of fiber flax, developed by years of selection, proved superior when tried out in field tests in eastern Michigan in comparison with other fiber flax grown for seed and upholstering tow. These varieties are called Pinnacle and F. I. No. 3. The variety Pinnacle produced 50 per cent of good soft tow, as compared with the usual yield of 35 to 40 per cent; the superintendent of an upholstering mill reported it as the best flax for the purpose that he had ever worked. The variety F. I. No. 3 produced 27 bushels of seed on a little less than 2 acres, and its tall straw gave an excellent yield of upholstering tow.

A sudden and severe outbreak of downy mildew on hops in Oregon and Washington required the aid of department scientists. Bordeaux mixture proved an effective control agent. Investigators also developed a simplified spreader formula. They obtained good results from crown treatments to prevent early mildew attacks on emerging vines and brought out new and important facts in the behavior of the disease under Pacific coast conditions. They discovered that mildew is brought into new plantings through infected cuttings. Mildew occurs in all the Pacific coast hop-growing sections except those of California and the Yakima district of Washington. Experiments have been started to develop hop strains resistant to this disease.

Strains of tobacco resistant to black root rot were developed by the department in cooperation with State agencies. This disease is important in some of the districts that raise flue-cured tobacco. Cooperative investigations in North Carolina produced resistant selections of three popular varieties—Cash, Jamaica, and Parris Wrapper. Black root rot occurs also throughout the Connecticut Valley where the yield and quality of Havana seed tobacco have decreased. Investigations in cooperation with the Massachusetts and Connecticut experiment stations developed Havana strains which, when planted on infested soils in 1931, in comparison with the regular Havana, gave yield increases that in some cases exceeded 100 per cent. Several of the new strains combine resistance to black root rot with high leaf quality.

Alfalfa—Milo—Crotalaria

A comprehensive breeding program to develop winter-hardy, wilt-resistant, and more productive varieties of alfalfa was conducted in cooperation with State experiment stations. These studies recently cast new light on the cause of declining alfalfa yields in the uplands of eastern Nebraska and in parts of Kansas and adjoining States. In these areas many alfalfa fields after being cropped for five or more productive years decline in productivity. When plowed and reseeded, the fields do not return profitable yields. On deep fertile soils, alfalfa roots penetrate 30 to 40 feet and exhaust the subsoil and moisture. Thereafter the crop depends on the annual rainfall. Old fields do not produce well when reseeded because the soil more than 5 feet below the surface is too dry for normal root development. By seeding alfalfa on land never before in that crop, farmers can get good yields for several years, but they can not get profitable returns indefinitely unless the subsoil moisture is renewed. Experiments are now under way to determine the effect of different cropping systems on the storage of subsoil moisture.

Bacterial wilt continues to cause a decline in the alfalfa acreage in Kansas and Nebraska. It is spreading into other alfalfa sections west of the Mississippi. Studies in cooperation with the Kansas Agricultural Experiment Station developed two highly resistant varieties, both of Turkestan origin. With these varieties, the Hardistan and the Kaw, stands can be maintained for several years despite the wilt. Other recent studies showed that leaf-hopper damage, which is often very serious in the Eastern States, does not result from a plant disease. The effects of leaf-hopper attacks seem to be wholly physiological. The symptoms can be duplicated by mechanical means. This discovery may indicate improved methods of reducing leaf-hopper damage to alfalfa.

Wheatland milo, a grain sorghum developed by the department in cooperation with the Kansas station, proved highly satisfactory in yield, in resistance to lodging, and in suitability for harvesting with the combine. Kansas farmers grew this new variety on about 2,000 acres in 1931. It also behaved satisfactorily on 1,000 acres in Oklahoma. Another special combine type of grain sorghum developed by the department, a variety called Beaver milo, became popular in Oklahoma, Kansas, and Texas.

Several species of Crotalaria, a legume introduced by the department into the United States in 1909, may become useful as a forage crop on light sands. Any plant that will make good forage on such soils has a future. Recent cooperative experiments indicated that Crotalaria has a feed value about equal to that of soybeans or alfalfa. Livestock eat six species of Crotalaria, both green and as hay, and a seventh as hay but not green. As a soil improver on the sandy lands of the South, particularly in tung tree and citrus groves, Crotalaria is becoming very popular.

Cutting Dairy Costs

How dairymen may get better returns from cheap home-grown feeds is shown in the results of recent feeding experiments with roughages. Dairy cows will produce milk and butterfat profitably when fed exclusively on alfalfa hay or on a combination of alfalfa and silage, either with or without pasture grass. It is only necessary that the roughages be of good quality. Tests showed that the best grass hays come from plants cut at a somewhat immature stage and cured with the retention of the natural green color and without the loss of leaves. Artificially dried hay proved superior to field-cured hay in color and in certain substances essential to the perfect nutrition of dairy cattle. In humid regions, artificial drying is the only certain way of making hay of the best quality.

Experiments to improve hay-drying methods are going forward. The department demonstrated also that there is a marked difference in the vitamin content of hays. Cows fed for long periods on inferior roughage decline in general health, reproductive ability, and milk production. Important differences in vitamin content exist not only between different kinds of hay, but between different grades of the same kind. This knowledge bears significantly on dairy-production costs, particularly in periods of depression when feed costs are high in relation to the prices of dairy products. In many regions pasture grass is the dairyman's mainstay. Yet no farm crop is more

neglected. Rotation grazing and fertilizing, the department found, improve pastures enough to make these operations profitable. Feeding experiments by the department developed a method of feeding dairy cattle more nearly in accordance with their nutrition requirements than was possible by following former rules. They demonstrated also that cottonseed meal is a safe and cheap feed for dairy cows, and that prejudice against it is unwarranted.

Investigators found that dairy-barn temperatures affect milk yields: temperatures maintained between 45° and 60° F. gave the best results under northern winter conditions. The investigations also demonstrated that many dairymen could milk their cows three times a day with increased profit, particularly if they use milking machines.

Breeding experiments with the department's dairy herds furnished additional proof that it pays to use sires of proved ability for transmitting uniformly high levels of milk and butterfat production. This is the most certain way to breed better dairy cattle. The ratio of unprofitable dairy cattle to profitable animals in the American dairy industry at the present time is 2 to 1. Records of the dairy-herd improvement associations show that, even among the relatively superior cattle owned by the members of these associations, one-third failed to produce enough milk and butter fat to pay for their feed. On this basis, the expense of raising 6,000,000 heifers a year for replacement includes a total loss of the money spent to raise 2,000,000 of them, because their beef value is offset by the deficit in their earnings while producing milk. Breeding experiments show that the development of herds purely for high production is practicable. So that the principles of cattle breeding may become better known, the department has developed a method by which extension workers and county agents may graphically portray the laws of heredity, and may explain the merits of the proved-sire program.

To assist in the selection of cattle for dairy purposes, the department devised a system of judging which gives as much consideration to the production record as to the conformation of the dairy cow. Dairy-cattle judging, as it is generally practiced, does not consider the cows demonstrated capacity for production. The new system should influence show-ring practices and educational work with dairy cattle.

Reducing Disease and Parasite Hazards

Animal parasite studies conducted with the Oklahoma station disclosed for the first time that three species of ticks can transmit anaplasmosis, an infectious febrile disease of cattle, from infected to susceptible animals.

Investigations revealed that a species of roundworm probably causes certain lesions in the livers of swine. Such lesions result in the condemnation of the livers at Federally inspected slaughtering establishments. The discovery emphasized the importance of the department's earlier demonstration that roundworm infestation in pigs can be largely prevented by a system of swine sanitation. This system was first demonstrated in the Corn Belt and is now being adopted by farmers elsewhere. Farmers in Tennessee tested it last year. One farmer raised 37 pigs on clean pasture. When 3 months old, the animals averaged 80 pounds. He allowed 12 other pigs the run of a dirty hog lot. These animals, when 3 months old, averaged less than 30 pounds and were unthrifty and unhealthy. Another farmer

raised a litter of fall pigs on bluegrass pasture, with corn, tankage, and ground alfalfa added to their ration. These pigs at 4 months old averaged 170 pounds in weight. The total cost of their feed was less than 1½ cents per pound, live weight.

Improved means of dealing with certain destructive parasites were developed by the department's poultry investigators. Facts discovered about the life cycle of six species of tapeworms became the basis of preventive measures. The work revealed 26 intermediate hosts that help to complete the life cycle of the tapeworms. The investigators also completed the life histories of six species of nematodes and discovered seven intermediate hosts of nematodes. Practical application of the discoveries followed immediately. With probable sources of infestation revealed, poultry producers can act to destroy the intermediate hosts or to keep fowls from feeding on them.

Another poultry project showed that the substitution of 10 to 20 per cent of rice bran for other feeds in the diet of growing chicks reared in confinement helps to prevent a disease known as perosis.

Asparagin

Asparagin, a rare and expensive amino acid formerly obtainable only from Europe, can now be produced in this country as a result of biological investigations in this department. Asparagin is valuable in investigations of bovine tuberculosis the organisms of which make exceedingly good growth on culture media containing asparagin. Its use permits the elimination of variable factors present in other culture media. Asparagin may perhaps take the place of beef broth and peptone as a source of nitrogen in the manufacture of tuberculin. This change would simplify the manufacture of tuberculin. The saving and the increased efficiency would be important because each year the department alone makes 15,000,000 doses of tuberculin for testing cattle. Other agencies make large quantities. Asparagin is a natural constituent of certain plants, particularly the lupines and the vetches. In the department's investigations, the plant known as *Lupinus albus* gave the best yields.

American Fertilizer Production

Not many years ago Chilean nitrate producers dictated nitrogen prices for the world. German and French producers similarly dictated potash prices. American farmers had therefore to pay high prices for two essential fertilizing materials. For the third principal ingredient in fertilizers, namely, phosphate, the United States depends on its own mines. Discoveries by this department have helped to place the United States well on the road to independence in fertilizer materials. So far as nitrogen is concerned the monopoly is over; research in the department fostered the production in the United States of cheap nitrogen from the air by a synthetic ammonia process. Though this country continues to import most of its potash, it has a substantial and growing potash industry, and American production promises shortly to be the controlling factor in domestic prices.

Work on the treatment of superphosphate with ammonia and the availability to plants of the water-insoluble phosphate thus formed has resulted in a change in the official laboratory method for the determination of available phosphoric acid. The change makes

possible a 100 per cent increase in the direct use of ammonia. This possible increase would normally amount to 80,000 tons of ammonia, valued at about $8,000,000. The new method was adopted in November, 1931, by the Association of Official Agricultural Chemists.

The basic facts necessary for the economical conversion of ammonia into urea have been determined and made available to the industry for use in establishing urea manufacture in the United States. American producers are thus put in position to compete fairly with foreign producers.

A study of the composition of all the commercial types of domestic phosphate rock was recently completed. Special attention was given to the occurrence of such elements as manganese, chromium, vanadium, iodine, copper, zinc, and arsenic, which may affect the growth of plants. These investigations have shown the influence of fluorine on phosphate availability in fertilizer and suggest new methods of fertilizer manufacture.

Fundamental studies of conditions affecting potash volatilization from Wyoming leucite (Wyomingite) have definitely demonstrated that complete recovery can be accomplished with the aid of some promoter, preferably calcium chloride, at fusion temperatures easily attained in the blast furance. Blast-furnace smelting of Wyomingite has been done on the small pilot-plant scale with the commercially complete volatilization of the potash, indicating a practicable process to be applied to the manufacture of agricultural potash from the great leucite deposits of Wyoming.

Investigations of Utah alumite, an important potash ore, have advanced the technology of its utilization in the manufacture of potassium sulphate, an important fertilizer salt, essential for certain crops, and of alumina, an essential by-product obtainable from that ore. In these investigations the recovery of the valuable sulphate constituent of Utah alumite and the purification of the by-product alumina, have been effected.

A new process has been developed and successfully tested whereby, with the use of ammonia and carbon dioxide, potash and ammonium sulphate can be easily manufactured from polyhalite, the potash mineral recently found in large subterranean deposits in western Texas. If the results of the potash work of this department were applied to the 1930 bill of $22,000,000 for fertilizer potash, this would represent a saving of $13,574,000.

Applying Fertilizers

Cooperative field studies of pecan soils showed that to produce pecans successfully the orchards must be tilled and fertilized. Tillage and fertilizers influence pecan-tree growth, nut yield, and size and quality of the nut.

Cotton root rot investigations in cooperation with the Texas station revealed that the rational use of fertilizers and the practice of modified tillage, in conjunction with crop rotation, soil conservation, and other fertility maintaining or restoring measures, will control cotton root rot in the black-land area of Texas.

As a result of soil-fertility and fertilizer investigations with sweet-potato soils in the Southeast, growers are profiting by using a higher potash fertilizer and by applying fertilizer broadcast over the row after the plants have been set.

Cooperative investigations of strawberry soils on the Atlantic coastal plain revealed that quickly available fertilizer materials applied in late summer result in healthier and more thrifty plants in early spring, and these plants produce larger yields of good-quality berries than plants to which fertilizers are applied in winter or early spring in several applications. This change in practice has netted berry growers considerable profit.

Manganese sulphate is effective in improving the vigor of citrus trees, character of foliage, color, and quality of fruit, investigations in Florida showed. Large areas of truck lands, which formerly were unproductive, have been made to produce profitably by the use of manganese sulphate.

Insecticides

Two new insecticides, deguelin and tephrosin, may prove valuable additions to the list of organic insecticides that can be used freely on vegetation without injuring it. Chemists discovered these insecticides in several tropical plants, derris root, cube root, and certain species of Tephrosia. Deguelin and tephrosin are not so poisonous to insects as is rotenone. However, they surpass nicotine in toxicity to aphids. They are harmless to man and to domestic animals when taken by mouth.

Rotenone also occurs in derris root and in the cube plant. This valuable new insecticide was further developed by the department's chemists. It is more toxic than pyrethrum to many insects. It is 15 times as toxic to bean aphids as pure nicotine and 30 times as toxic as lead arsenate to certain caterpillars; yet, so far as known, like deguelin and tephrosin, it does not harm man or domestic animals when taken by mouth. Fruits and vegetables sprayed with rotenone need not be washed. The department's chemists recently determined the chemical structure of rotenone and thus opened the way to definite attempts to prepare the material by synthetic chemistry. It may be possible also to synthesize the related compounds, deguelin, and tephrosin.

The possibility of successfully growing pyrethrum, an important plant insecticide, in the United States was materially increased as a result of harvesting experiments conducted by tbe department. In these experiments pyrethrum, for the first time anywhere, was harvested with a grain binder. The portions of the plant used in manufacturing spray insecticides were successfully separated from the dried crop by machinery. This eliminated the need for a great amount of hand labor.

Dissolved Salts in Irrigation Water

A major problem in irrigation farming is the prevention of injury to the soil or directly to the crops from the accumulation in the soil of dissolved salts contained in irrigation water. It has become evident in many irrigated areas that the sustained productivity of the soil may be imperiled by the effect of these dissolved salts and thus that the quality of irrigation water is a matter of serious economic importance. Where irrigation water contains much salt it should be used copiously with adequate drainage. This will prevent a dangerous accumulation of dissolved salts in the soil solution. Among the salts that cause serious injury to crops, attention has been focussed recently on the salts of boron. While boron in very small quantities

is essential to plant growth, excessive quantities in the soil solution cause serious crop injury. Scientists at the California Experiment Station demonstrated that boron was the cause of a certain type of injury to lemon and walnut trees. The discovery led this department to study the problem. Subsequent investigations have shown that boron occurs chiefly in irrigation water and is thus carried to the land where its accumulation causes crop injury. It has been found possible in many cases of such boron injury to find the sources of boron contamination and to eliminate these from the irrigation supplies, or by blending such supplies to obtain noninjurious dilutions. Extensive observation in California and Nevada where the salts of boron occur in irrigation water has indicated that serious crop injury may result if the concentration of boron exceeds 1 or 2 parts per million. As noted above, prevention of boron injury is frequently possible, and the results of studies now going forward may be expected to reduce the danger of injury still further.

Engineering Developments

Various mechanical appliances developed by the department's agricultural engineers helped to reduce farm costs of production. To combat the European corn borer, engineers devised a simple stalk shaver for cutting cornstalks flush with the ground. Used where the corn has been picked, this device enables farmers to remove and destroy borers that would otherwise remain in the fields and multiply. A trash shield for use with moldboard plows makes it possible to bury corn débris so that it will not afford shelter to the borer. The engineers also reconstructed two types of commercial seeders so that they could be used to distribute poison bait for grasshoppers.

The department developed experimental machines for applying fertilizers accurately at predetermined rates and in various positions with respect to the seed. Chemical and plant research had demonstrated the importance of this. It had shown that results from the use of fertilizers, particularly the highly concentrated fertilizers, depend greatly on the manner in which the plant food is distributed. Scattered unevenly or placed too near or too far from the seed, such fertilizers lose much of their value, and may even do harm. Fertilizers placed too near cottonseed or in contact with it may prevent germination. The machines developed in the department promise greatly to increase the efficacy of commercial fertilizers. Tests with the machines showed, for example, that fertilizers give the best results on cotton and beans when placed about 1½ inches to the side of the seed and 2 inches below it. Placed nearer to the seed, the fertilizer tended to injure it; placed farther away, it lost some of its effect.

By rearranging and reshaping the shovels of the ordinary beet cultivator, engineers devised an implement for cross blocking sugar beets. This cross blocker cuts the cost of thinning and blocking by one-third.

A vertical type seed-cotton drier, upon which a public patent has been obtained, worked well in commercial operations. Several plants and ginneries tried it during the 1931–32 harvesting season. It improved the preparation of the ginned lint and eliminated delays due to bad weather or to poorly conditioned seed cotton. This type of drier is simpler to operate and costs less than a horizontal type pre-

viously developed by the department. Makers of ginning equipment have begun to manufacture it.

Practical and economical ditch-cleaning methods which should materially reduce the cost of this work have been developed by department engineers. This means a great deal to farmers in irrigation and drainage areas, especially now that funds for such work are greatly curtailed.

Advances in Pest Control

The development of a poisoned impregnated band to be placed about the trunk and larger branches of fruit trees to attract and furnish hibernation quarters for the codling moth has, by killing such larvae through absorption of the poison, provided a new and valuable adjunct to spray control.

A thrips, one of the more important pests of citrus in central California, is now being controlled by dusting with finely divided sulphur. This substitutes for the old liquid lime-sulphur spray. It saves about $8.50 per acre in the cost of treatment.

The Mexican fruit fly proved resistant to the ordinary copper carbonate fruit-fly spray. Consequently, the department developed a nicotine sulphate spray, which is now being employed throughout the important citrus-growing region in the lower Rio Grande Valley.

Japanese beetles eat the silk of sweet corn, causing material losses in areas where they are abundant. Studies of repellants led to the discovery that hydrated lime will protect corn from such attack. For the practical application of lime dust to growing corn, the department devised a modification of the common type of dusting machinery and it is now possible, under such treatment, to grow sweet corn profitably in areas where beetles are abundant.

Cattle grubs decrease the annual value of hides in the principal markets of the United States by $5,000,000 to $10,000,000. This leaves out of account the even greater losses in milk flow and failure to put on flesh during the period of fly annoyance. Such losses can now be greatly minimized by warble-fly and grub control methods developed and recently improved by the department.

An important pest of the pecan, the phylloxera, is now being effectively controlled by contact sprays applied late in winter or early in the spring before the insects have emerged to make their leaf galls.

Two new fumigants for insects infesting grain and other agricultural products in storage have been developed by the Bureau of Entomology and the Bureau of Chemistry and Soils and these fumigants are now widely used throughout the country for treating a great variety of products, including clothing and house furnishings. These new fumigants are the ethylene dichloride-carbon tetrachloride mixture and the ethylene oxide-carbon dioxide mixture. They are efficient, nonexplosive, and involve little or no risk to the operator.

The development of an important bean and cowpea industry in California was followed by the appearance of bean weevils, which soon threatened these important crops. Entomologists perfected control measures which include fumigation, enforced by regulations. It is now possible for growers to maintain their markets and the high standard of their products.

Similarly, the dried-fruit industry of California has been greatly aided by the development of means of preventing or minimizing losses

caused by dried-fruit insects. Consequently, at no time has it been possible for the dried-fruit industry to offer the public so excellent a product as at present.

The causes and means of preventing foul brood and other diseases of bees have been determined by department entomologists who have also developed improved methods of wintering bees, making it possible to eliminate the risk of high mortality and weakened colonies in the spring.

Farm Management and Farm Costs

Technical research gives the best results only when supplemented by research in farm management. Costs and profits are the final test of farming methods, new or old. Farm-management studies that measure costs and profits have therefore an intensely practical application.

Farmers must know how the findings of science work out under actual farm conditions. Some years ago, for example, the McLean County method of handling hog litters on clean ground, free from parasites, made it possible to materially reduce the cost of producing hogs. But the full benefit of this method could not be realized until its effects had been measured under actual farm conditions. Farmers *could not be persuaded to adopt it generally until they had proof* of its worth. Farm-management studies afforded the necessary evidence. Information gained in these studies, when communicated to farmers through extension activities, influenced hog-raising practices favorably, and meant substantial additional profits. Farm-management studies likewise added greatly to the practical value of cow-testing apparatus. Tests demonstrated the utility of this apparatus in facilitating the culling of low-producing cows.

Many important farm problems demand farm-management research as a first step toward their solution. Among these are such matters as the most profitable size of the farm, the most efficient management of the available labor supply, and the best use of the farmer's capital, time, and land. No two farms are exactly alike. No two farmers are identically placed as to capital, skill, and labor supply. Hence, the organization of a farm for production is a highly individual problem. But this does not mean that the study of numerous farms can throw no light upon this individual problem. On the contrary, the investigation of farm organization on a broad scale results in helpful conclusions as to many of the elements of effective farm organization and operation. Farm-management studies, by systematically analyzing the experience of many farmers, help individual farmers. Farm-management research connects with the department's outlook program It helps farmers to relate general economic information to their individual needs.

RESEARCH THAT PREVENTS WASTE AND WIDENS MARKETS

Research that tends to reduce spoilage and other wastes in the distribution of farm products and to widen markets is of prime importance. The long-distance shipment of fruits and vegetables and the extensive Federal service connected therewith resulted largely from research done in this department in cooperation with the State

experiment stations. Economic investigations at home and abroad often indicate how producers may adapt their goods more closely to consumers' requirements. The prevention of waste in distribution benefits both producers and consumers, because it narrows the spread between producers' and consumers' prices.

Rancidity in Foods

The annual value of foods which are subject to spoilage by rancidity is more than $1,000,000,000; feeds and industrial products likewise subject to rancidity amount to several hundred millions more.

Light plays an important rôle in the development of rancidity. This was recently demonstrated by the department in experiments that led to the granting of a public-service patent to make the discovery available to the American public. The experiments showed that the portion of the spectrum lying between 4,900 and 5,600 Angström units, which imparts the color approximating chlorophyll green, prevents or delays rancidity. On the other hand, the parts of the spectrum lying on either side of this portion stimulate and hasten rancidity. This photo-chemical discovery has numerous immediate practical applications. Wrapping oil-bearing foods in materials of the proper shade of green will keep them longer. Black wrappers will do the same thing because black absorbs all wave lengths of light. The discovery applies to butter, lard, nuts, potato chips, mayonnaise, cookies, crackers, whole-wheat flour, corn meal, and other products. In the common wrapper all the commodities specified become rancid in a relatively short time. This discovery should save millions of dollars to manufacturers and consumers.

Fruits—Potatoes

Temporary storage of some fruits and vegetables in atmosphere relatively high in carbon dioxide is an effective substitute for precooling, scientists discovered. This treatment holds rot organisms in check and delays the ripening process somewhat. Stored pears treated with carbon dioxide generally have a better flavor than pears not so treated. Carbon dioxide treatment of grapes soon after they are packed may double the period during which they will remain in a satisfactory marketing condition. In several experiments the flavor of the treated grapes remained normal and the berries remained attached to the stems longer than the berries in untreated lots. Grapefruit exposed to a 45 per cent carbon dioxide atmosphere for three days did not develop pitting until about three weeks later than grapefruit handled in a normal atmosphere.

Scientists demonstrated that spoilage of potatoes can be reduced by controlling temperature and humidity in storage buildings. In one experiment, potatoes stored in a well-built, carefully managed house showed only a 5 per cent loss of weight and practically no rotting or sprouting during the storage period, and the building itself showed no signs of deterioration. In another building which was poorly built and poorly managed the spoilage amounted to 20 per cent, and the building deteriorated markedly.

Reducing Waste and Costs in Transportation

The department recently showed how waste and costs may be reduced in handling and transporting fruits and vegetables. In orange shipments from California to eastern markets a new method permits safe shipment with only one re-icing in transit instead of the 10 or 12 re-icings required under the standard refrigeration previously used; this innovation may save orange growers as much as $1,000,000 a year. The department also demonstrated that precooled Bosc pears may be shipped from Oregon to eastern markets during October and November without refrigeration. This reduces the cost of shipping about $90 a car. It gets pears to market in the condition desired by consumers and obviates most of the expense and trouble of conditioning fruit on its arrival. Precooled strawberries, too, may be moved without re-icing the cars in transit. Damage to pears and apples on the bottom layer of commercial car-lot shipments is often a type of bruising, scientists determined last year. Such damage is frequently attributed to freezing during cold weather and costs the railroads heavily in claims. It may be prevented almost entirely by using a resilient, corrugated cardboard lining in the boxes. Savings thus effected benefit the railroads in the first instance, but should reach growers ultimately.

Dust Explosions

Losses from dust explosions in grain-handling operations have been reduced, and a saving of human life has resulted from recent research in the department. The average loss per grain-dust explosion has decreased from $520,000 in 1921 to about $28,000 in 1931. Annual losses dropped from $4,160,000 in 1921 to $1,100,720 in 1931. This result may be largely attributed to the application of facts determined by research. Grain-threshing operations in certain sections of the country have been so improved and the hazard of dust explosions so much reduced, as to make possible a direct and substantial saving in insurance premiums. The total potential saving in this field in the Pacific Northwest alone is $570,000 annually. The potential saving on cotton-gin insurance, on gins properly equipped with grounding systems for fire prevention developed by the department, is estimated at $300,000 annually.

Widening Markets

Some things necessary to insure a better foreign market for Wiltshire sides of pork produced in the United States came to light in a recent investigation. American hog producers had believed that Wiltshires for the export trade should not be fat. Comparison showed, however, that Denmark, Sweden, Poland, and Ireland export Wiltshires fatter than those produced in this country. American Wiltshires were in fact the leanest of all the samples studied. A chemical analysis showed that the American Wiltshires had been more heavily cured than those from the foreign countries. The milder curing of the foreign bacons, nevertheless, was sufficient to keep them in sound condition during their shipment to this country and during extensive laboratory testing. This indicated the advisability of a milder cure for American Wiltshires intended for the

foreign market. Mild curing enhances the palatability of bacon. In view of the results of these comparisons, American methods of handling Wiltshires will no doubt be modified.

Chemists in the department and in the State experiment stations perfected chemical washing solutions, processes, and apparatus for removing lead arsenate residue from apples, deposited there in spraying for insect control. These measures saved the export apple business of the United States when Great Britain, Germany, and other countries refused to accept American apples carrying more than 0.01 grain of arsenic (As_2O_3) per pound. The same measures made the domestic product safe for consumption. Growers were compelled to remove the residue from their apples. It is insoluble in water and adheres tightly to the fruit. Its removal was therefore a problem for the chemists, who developed hydrochloric acid, acid-salt, and soda solutions that proved effective. Without chemical washing solutions, practically no American apples could now be marketed abroad.

A new method of canning green vegetables without adding liquid was recently devised. This method, which conserves the natural flavor much better than the older methods, should materially increase the demand for certain canned vegetables.

Growers in Florida regard the coloring of citrus fruits as a necessary feature in preparing them for packing and shipping. Cooperative investigations established the requisites for satisfactory coloring. It is possible, under the most favorable conditions, to color the greenest appearing though physiologically really mature oranges in less than 72 hours and usually in not more than 60 hours. The ethylene "trickle" system colors the fruit more rapidly than kerosene fumes and much more rapidly than the ethylene "shot" method applied, as is the commercial practice, at 8-hour intervals. These investigations also showed how the usual time required for coloring fruit under California conditions may be materially reduced.

RESEARCH THAT FINDS NEW USES

Investigations to discover new uses for farm products and by-products have been conducted by the department for many years and have produced notable results. An example is the citrus work of the department which developed processes for the manufacture of citric acid, lemon and orange oil, pectin, marmalades, stock feeds, and other valuable by-products. This work enabled the California citrus growers to market profitably large quantities of over-sized and odd-shaped fruits which previously had been wasted. The industrial application of the department's citrus studies rehabilitated a great industry and made the United States independent of foreign sources for lemon oil, citric acid, and pectin. The department's studies in the utilization of farm products and by-products continue to pay big dividends, as the following examples show.

Rayon—Starch from Sweetpotatoes

With dilute nitric acid as the pulping agent, the department developed a process for making high-grade cellulose from bagasse, the waste from sugarcane after the sugar has been extracted. High-grade cellulose is the basic material for rayon. This process is important to viscose-rayon producers because it creates a large new source

of raw material, available each year. The viscose-rayon process produces about 85 per cent of the world's rayon and uses as its raw material from 45 to 55 per cent of high-grade wood pulp. From 250,000 to 500,000 tons of bagasse accumulate each year at the sugar-cane mills of the United States. For some years about 20 per cent of this volume has been used for manufacturing structural insulation board, a previous discovery of this department. The possibility that a higher grade of cellulose could be produced from bagasse led the chemists to experiment with it. The department's experiments produced a higher percentage of high-grade cellulose from bagasse than did any previous attempts.

Cheap supplies of nitric acid make the new process commercially feasible. Chemists had previously recognized the possibility of using nitric acid in the cellulose process, but until recently the acid has been too expensive for use in commercial pulping. With gradually diminishing forests, and with the forest supplies receding from the manufacturing centers each year, there has been an increasing need for a new supply of raw material for rayon manufacturers and other cellulose industries. The new process increases the potential value of bagasse, and at the same time offers a new and steady source of raw material for the viscose-rayon industry. The department regards the process as now developed to a point at which commercial interests can work out the practical problems of manufacture.

Chemists in the department devised a method of producing high-quality starch from cull sweetpotatoes. Indications are that this starch is suitable for use as a sizing in the cotton textile industry, thus replacing imported potato starch. The utilization of cull sweetpotatoes in starch production would increase the returns to sweetpotato growers by several million dollars annually. At present a large proportion of field-run sweetpotatoes are thrown out as oversized or undersized, and largely wasted. In some sections the proportion of culls in 1931 was 50 per cent. Unusually rigorous grading was one cause of this high percentage, but the wastage from the sweetpotato crop is usually large. Some cull sweetpotatoes are fed to livestock. This use, however, comes nowhere near absorbing the supply. Starch production from sweetpotatoes, besides benefiting growers, would promote industrial development.

Calcium Gluconate—Lignin—Furfural

Chemists in the department developed a low-cost method of producing calcium gluconate by the action of a mold on corn sugar. Calcium gluconate is of great value in treating various diseases, and its production by the new method can utilize much surplus corn.

Recent work on lignin, a component of all agricultural wastes, has shown that several synthetic resins can be produced from it, as can eugenol, the essential constituent of oil of cloves, and vanillin, the flavoring constituent of vanilla.

By processes developed in this department, industrial chemists produced from agricultural wastes last year more than 1,000,000 pounds of furfural. Some 5,000,000 pounds of oat hulls, which would otherwise have been wasted, were thus utilized.

Tannin—Wool-Scouring Wastes

Research to develop means of utilizing hemlock-bark offal from lumbering and pulp production is under way. This material is a potential source of tannin, which this country imports in large quantities for tanning leather.

By-products having an annual value of $5,000,000 to $6,000,000 can be obtained from wool-scouring wastes, investigations indicate. These wastes include 60,000,000 or 70,000,000 pounds of wool grease used for leather stuffing, waterproofing, lubricating, and in producing lanolin and certain fertilizer materials. For these purposes, the United States imports nearly half the wool grease it annually consumes, while allowing most of its own wool-scouring products to go to waste.

Research is under way to develop processes for producing fuel and illuminating gas, organic acids, solvents, and carbon from wastes such as cornstalks, corncobs, straws, cotton stalks, and sugarcane bagasse.

Inulin—Soy Sauce—Molasses

Inulin, the principal constituent of chicory root, is thought to be the most suitable carbohydrate available for the diet of persons suffering from diabetes. Recently the department devised a method of producing extremely pure inulin by a simple and cheap process, the most suitable source being chicory, now grown in limited quantities in the United States as a coffee substitute. As a source of inulin the chicory crop might become much more important.

Soy sauce, now wholly imported, could easily be manufactured on a commercial scale in this country, experiments show. Development of the soy-sauce industry would provide an outlet for part of the soybean crop.

Barbados molasses is imported in large quantities because of its desirable flavor. Chemical investigations in this department recently revealed a clue to the nature of this flavor and indicated the possibility of producing it in sirup of domestic origin. Success in this investigation would substitute a domestic molasses for the foreign product.

Fruit Pulp

Experiments at the department's laboratory of fruit and vegetable chemistry at Los Angeles developed a new fruit product, frozen fruit pulp, which promises to afford a new and profitable outlet for fruit heretofore graded low and sold at a low price. Fruit for the fresh-fruit market or for the cannery is usually picked at the hard-ripe stage. As a result, much fruit too ripe for the higher grades of canned goods finds its way into the cannery, is canned as water-pack or pie stock, and brings a lower price than fruit packed in sirup. Yet it has the best flavor and the highest natural sugar content of all the grades canned. It has proved to be the grade best adapted to the production of frozen fruit pulp.

In the production of this commodity fruits are pulped, blended with sugar sirup, quick frozen at −40° to −60° F., and stored at 4° to 9°, either in paraffined cups or in unlacquered tins. The product fully retains the fresh-fruit flavor and has a remarkably smooth texture. It can be made from apricots, peaches, nectarines,

plums, prunes, pears, pineapples, grapes, and berries of various kinds. Present indications are that the new process will transform into a high-quality product what is now a low-grade and low-priced product. It will furnish the food manufacturer with a new and highly desirable fruit base and give the consumer a tree-ripened, full-flavored product unlike anything now on the market. The canning, container, and storage industries are cooperating with the department in experiments to improve frozen fruit pulp.

Dairy Products

By a process recently developed in the department milk sugar can be removed from skim milk without affecting the casein. This process is particularly valuable to the ice-cream industry. It enables ice-cream makers to increase the amount of milk solids not fat, in ice cream by about 20 per cent, without any risk of causing the defect known as "sandiness." Milk solids thus added to ice cream improve both its quality and its nutritive value.

The department also developed a process by which milk may be held frozen as long as three weeks and restored to its normal state without loss of flavor or of physical properties. It has devised equipment for separating albumen from cheese whey, without impairing its physical properties. Added to cows' milk this by-product gives it the approximate composition and properties of human milk. Another process developed in the department permits American cheddar cheese to be ripened in cans without molding or swelling. It permits the marketing of the natural cheese in an attractive package and eliminates waste due to loss of moisture and the formation of a rind.

Forest Products

Investigations to develop better methods of utilizing forest products produced substantial results. Studies of sulphite, sulphate, and semichemical pulping processes enabled mills to increase their pulp yields by from 5 to 10 per cent. Five mills using a process originated by the department converted chestnut chips, a waste product from tannin extraction, into corrugated boards for boxes. This research also developed a practical process for making high-grade white paper from the fast-growing southern yellow pines.

Studies in turpentine operations demonstrated that weekly ¼-inch chipping, instead of the ½-inch chipping now generally employed, doubles the resin-bearing life and the total resin yield of the tree. Measurement of the strength properties of 160 different woods led to the development of more efficient structural grading rules; these make possible an increase in allowable working stresses in building construction, and permit the use of less material and a wider selection of woods. A study of joints and fastenings in timber construction showed how joint strength may be increased from five to six times. Experiments developed methods of producing wood plastics at reduced costs.

Research results gained in the department have brought about great changes in the kiln drying of lumber. These changes in the case of hard-woods effect a saving in kiln drying estimated at $1 per thousand feet. The corresponding saving in the case of softwoods is $1.50 per thousand feet. Commercial kilns have installed more than 15,000 fan units on principles developed by this department. Other

studies have improved the technical basis for the air seasoning of commercial woods. Studies of logging methods and equipment have indicated opportunities for preventing waste in lumbering. Findings in regard to selective logging promise substantial savings to operators and also a better adjustment of lumber production to market demands.

RESEARCH THAT HELPS TO ADJUST PRODUCTION TO DEMAND

In adjusting production to demand, farmers need both technical and economic information. They can use the technical information particularly in making their production more dependable and controllable, and in developing noncompetitive lines of production. Several crops not previously grown in this country and not competing with any other crop grown here, have been introduced by the department. Among them is the Washington Navel orange, which now constitutes the bulk of California's orange production. More recently the department introduced the avocado, the mango, Chinese and Japanese persimmons, the papaya, and the pistache nut. Economic studies, particularly in farm management, help farmers to balance their different crop enterprises so as to get the best net result. Technology shows how to grow while economics indicates what should be grown.

Many of the research achievements of the past year that help to adjust production to demand have already been included in this report under the section on research that reduces costs of production. Thus the new varieties of plants developed to resist specific diseases make farming operations more dependable and, consequently, more easily adjustable to the market requirements.

New and Noncompetitive Crops

In recent years the department has introduced into this country and has tested many new crops to determine their adaptability to soil, climatic, and market conditions here. Such work is indispensable. Volunteer cooperators can not do it efficiently in its early stages. It is a task for the expert, and it takes time.

Date culture, for example, has outstanding possibilities. This country at present imports more than 20 times as many dates as it grows. The date industry, scarcely 10 years old in the United States, originated with the introduction by the department of the choicest dates from Old World gardens. It received an immense impetus when the department's scientists developed a method of propagating date palms free from insect pests and fungous diseases. It received another stimulus in 1925 when investigators ascertained that date ripening can be controlled beneficially by using special kinds of pollen. In regions having summers too short or too cool to permit the ordinary maturing of dates, growers can use a pollen causing earlier ripening. In regions where excessive heat tends to make the crop ripen too early, they can use a pollen causing late ripening. Assisted by these discoveries, American growers now produce several million pounds of fancy dates annually. These dates are so superior in quality that they have opened new markets, without as yet diminishing the demand for imported dates. The date industry may therefore be expanded greatly without harm, and indeed with benefit to American agricultural interests in general, since the grower who

puts land into dates withdraws it from other uses. In recent years the department has introduced date varieties which promise to be suitable for southern Texas and for home gardens, to be sold in both local and distant markets.

Satsuma Orange—Tung Oil

Another promising new and noncompetitive crop is the early ripening strain of the Satsuma orange. The department's plant explorers introduced this orange from Japan into the Gulf coast region. In the warm climate the early ripening strain grows more vigorously and produces heavier crops of large fruits with better shipping qualities than it does in Japan. In the Gulf coast region the so-called Wase Satsuma oranges ripen between the middle of September and the last week in October. This is a period in which almost no other tree-ripe oranges come on the market.

The United States imports annually about 100,000,000 pounds of tung oil. In 1905 the department introduced the first tung trees into this country. By 1927 commercial plantings occupied 3,000 acres in Florida. Other States had experimental plantings. Tung oil is used in the manufacture of varnish, enamel paint, floor paint, flat wall paint, and paint driers. It comes from two species of Aleurites, a small genus belonging to the spurge family. Both species thrive in China, the chief present source of commercial tung oil. Department scientists believe that new and superior varieties can be produced by hybridization. The American tung-oil industry, already developing through the original plant introductions, may by plant breeding be greatly stimulated. Tung trees in Florida and several other States yield light-colored oils low in free fatty acids and superior to most of the tung oils imported from China, where the growers still use very primitive methods. This tree has qualifications that make it the potential basis of a thriving industry in the United States. It grows well in Florida and the Gulf coast region, yields well, and its product has a noncompetitive domestic market.

Egyptian Cotton

Though it produces more cotton than any other country, the United States imports large quantities of Egyptian cotton for special uses. Department scientists made the first introduction of Egyptian cotton some 20 years ago. They believed that American Egyptian cotton could supply important domestic requirements without competing with other American varieties. This forecast was fulfilled. American Egyptian cotton grown in the Salt River Valley of Arizona to-day supplies the longest and best Egyptian cotton needed by American spinning mills. It meets a growing demand by the manufacturers of high-duty automobile and truck tire casings. Scientists are constantly improving it. Because its cultivation is limited in geographical range it will not soon, and perhaps never, satisfy the whole domestic need for this type of cotton. Therefore the acreage of Egyptian cotton can be expanded within the United States without injuring producers of other types of cotton.

Farm-Management Studies and the Outlook

Farm-management studies, based on complete records of labor, power, equipment, and material used in farm operations, have indicated possibilities for profitable crop shifts. Farmers must constantly readjust their operations to changing conditions. Analyses of farm operations and of farm returns in cooperation with State stations provided for many areas a dependable basis for readjustments. Surveys of a group of farms in the Red River Valley, for example, demonstrated the advantages of a change from wheat to feed grains, pasture, and livestock. The surveys also showed the advantages of a shift from a beef-cattle production system, involving the purchase of steers, to a system of baby-beef production. Cooperating with the State experiment stations, the department's investigators worked out budgets with individual farmers. Adoption of these budgets produced a definite improvement in farm returns. A study in the Pacific Northwest showed the savings that could be effected by bulk handling as compared with sack handling of grain. Studies of irrigated farms revealed the best cash crops for the present period of uncertain farm incomes. Studies of range-livestock management pointed to the desirability of some changes in the Dakotas and Montana. These are merely examples of the value of the department's farm-management research as an aid in adjusting production to demand.

Experience has shown that most farmers adjust their production on the basis of prices received during the preceding year. Price analyses and related economic research in the department are designed to interpret existing supply and demand conditions so as to give the farmer a basis for adjusting production to the market situation that lies ahead of him. The department's outlook program, now conducted on an extensive scale in cooperation with State agencies, helps the farmer to do this.

The progress of technological and economic research, designed to increase farm returns by reducing costs and adjusting the individual farmer's production to demand, leads to the important problem of total production in agriculture in relation to market demand and prices. Obviously it is to the interest of the Nation as a whole, and certainly to the interest of agriculture, that the total supply of farm products should be produced on land best suited to low-cost production. This opens the broad question of research in land utilization which I shall discuss in a later section of this report.

RESEARCH THAT IMPROVES QUALITY

Quality-improvement investigations by the department have both economic and technical aspects. Economic studies indicate the relative market demand for goods of different quality, and emphasize the necessity of reflecting premium prices back to farmers. Scientific studies, such as the investigations that produced the Marglobe tomato, Pima cotton, and other well-known plant varieties, enable farmers to grow better products when the demand arises. Markets usually recognize quality in the long run, though at certain times premiums for quality may not be adequate. Quality-improvement work has special value in periods of overproduction. It helps farmers

to concentrate on quality rather than on quantity. Quality investigations by the department during the last fiscal year produced some outstanding results.

Quality in Meats

The department a few years ago began to study the quality of meats, an important field to which little attention had previously been given. This study, in which more than 20 State experiment stations have cooperated, reveals the importance of high quality in meats, and helps to develop reliable standards and methods of determining and producing high quality. It has shown, for example, that retarded growth lowers the palatability of meat; that there are no marked differences in the palatability of the meat of different breeds, although there are striking differences in the palatability of meat from individual animals of the same breed, which indicates the desirability of selecting and breeding animals for meat of high quality; that the grade of the carcass is closely related to the thickness of the external fat or the degree of finish, indicating the importance of securing the minimum degree of finish that will produce the necessary yield and market quality. Recent findings indicate that high-quality meat and lamb can be produced on pasture, an important fact in the more economical production of high-quality meat; that best results in beef production are obtained when the beef is produced on good grass with a small amount of grain to insure maximum gains; that in lamb production there is no material advantage in feeding a supplementary grain ration so far as quality of the meat is concerned; and that tenderness of meat is much influenced by inheritance and by conditions of storage.

Dairy Products

To improve the quality of milk produced in the United States the department recently developed an area plan under which the quality of milk is improved in a small area which is then used as a demonstration area from which better dairy practices may spread. In the first stage, the department starts and develops the project. As soon as the quality of the milk produced in the selected area improves, the project is turned over to State agencies for further promotion. This plan has important economic possibilities. Dairymen suffer heavy losses annually through marketing off-flavored and sour milk, and dairy products below standards in other ways, whereas they could increase their receipts tremendously by producing only high-quality milk. Other investigations by the department disclosed possibilities in the processing and distribution of milk. The results of these investigations have shown milk dealers how to hold down their processing and distributing costs, and thus diminish the spread between the farmers' price and the consumers' price. Further improvement is possible and recent investigations open up promising lines of effort.

In the Southern States where cheese making is a comparatively new industry the department assists factory managers to establish manufacturing methods that will improve the quality and yield of the product. A department dairy specialist visited one factory that was receiving about 60,000 pounds of milk daily and making 6,000 pounds of cheese. The manufacturing methods were such that only 50 per cent of the product graded No. 1; the rest graded No. 2.

During the few days while the specialist was at the factory he introduced changes that enabled the establishment to make its entire output into No. 1 cheese. This resulted in a return increase between $9,000 and $10,000 a year.

The department also helps creamery managers to establish a system of buying cream on the basis of its quality. In every creamery that has adopted it, this system has improved the quality of the product and obtained better prices. In turn the creameries pay better prices to the farmers.

Lettuce

Varieties of lettuce recently introduced by the department set new standards of quality and at the same time resist both mildew and blight. The double-resistant lettuce, Imperial D, seed of which was distributed to growers in the fall of 1931, is considered the best quality lettuce of the New York or Iceberg type. It has thicker, crisper, and better-flavored leaves than any of the other varieties. Another high-quality variety, Imperial F, was introduced in 1930, and growers produced it on a large commercial scale last year. It appeared entirely resistant to both mildew and blight. A few years ago a disease known as brown blight threatened the lettuce industry of the Imperial Valley of California with complete destruction. Plant specialists from the department developed resistant varieties by breeding and selection and thus saved the industry. Returns to growers from the new varieties ran as high as $8,000,000 in some recent years. The crop last year, though reduced in volume and low in price, brought the growers approximately $4,000,000. The importance of the disease-resistant varieties may be judged from the fact that the district where they are grown produces nearly half the lettuce grown in this country. Early this year the department released to growers seed of a new brown-blight-resistant strain of the Iceberg type, under the name of Imperial No. 13. In commercial-scale plantings it proved specifically adapted to harvesting from about January 10 to February 20 in the Imperial Valley. It seems to be the only strain which can be depended upon during that period to make a high percentage of sufficiently large heads of good quality.

Sirup—Orange Juice—Soybeans

Investigations developed means of preventing the crystallization of sugar from cane sirup and of controlling the flavor and color of cane sirup by the use of decolorizing carbon. This was an important step toward the more uniform production of high-quality sirup. Thousands of farmers in the United States grow sugarcane for cane sirup and sorgo cane for sorgo sirup. These are substantial cash crops. Out of an annual production of about 30,000,000 gallons, approximately 60 per cent is marketed, but the price received by the farmer varies by as much as 200 per cent. Only sirup of a grade high enough to be sold direct to the consumer brings the best price. Lower-grade sirup must be sold for blending. If all the sirup produced were of satisfactory market quality, the returns to growers would be substantially increased.

Citrus-fruit investigations promise success in developing a method of preventing deterioration in the flavor and quality of orange juice.

This should result in an immediate increase in the sale of this product. Results of former work in citrus utilization are instructive. Maturity standards developed by the department some years ago have stabilized and extended the fresh-fruit market, and it is estimated that these standards have added at least 35 cents a box to the value of citrus fruit during the last five years.

Soybean varieties differ greatly in their food value. This was demonstrated in connection with soybean selection and breeding studies. The finding has obvious practical significance. The protein content of different varieties ranges from 28 to 43 per cent, and the oil content from 12 to 23 per cent. The oil content alone does not measure the value of a variety for oil production because the quantity of oil released under pressure differs. Under a given pressure, one variety will yield as much as 60 per cent of the oil it contains, while under the same pressure another variety may yield only 10 per cent. This fact is important in selecting varieties of soybeans for oil production. Soybean varieties differ widely also in their content of certain amino acids important in nutrition. This fact has a bearing on the use of soybeans and soybean meal in the production of macaroni, vermicelli, all noodles, bread, and other food articles.

Honey

The quality of honey has been greatly improved and stabilized by the work of the department in developing efficient controls for foul brood and other bee diseases and in the establishing of standards for all classes or types of honeys.

Experiments have shown that honey may be clarified by electrical neutralization and flocculation of its colloidal constituents through action of colloidal materials of opposite electric charge. This treatment produces brilliant clarity, reduces foaming and scum formation, prevents granulation over long periods of time, and reduces caramelization on heating, thus eliminating objectionable characteristics of honey which have restricted its marketability. Improvement of commercial quality in this manner would undoubtedly widen the field of use of honey and would be of great financial benefit to the entire honey industry. Methods and technic for applying this finding to commercial practice are now being studied and encouraging results have been obtained.

Grades and Standards Affect Quality Improvement

Farmers who wish to improve the quality of their products benefit from information made available by the commodity grading and inspection services of the department. Such information shows how crops grade, indicates specific causes for low grades of products, measures the appearance or increase of crop diseases, records the market value of new varieties, reflects the influence of new machinery and new handling methods on the quality of farm production, and furnishes clues to shifts in market requirements. Facts of this sort strongly influence producers, plant breeders, horticulturists, farm-management leaders, and agricultural extension educators. Research men check the practicality and usefulness of their work by facts developed in standardization and grading services. Inspection data on wheat dockage, smut, excess moisture, and mixed types emphasize the

need for improved farm-management, handling, or marketing methods. It applies also to investigations in the improvement of grain cleaning, conditioning, handling, and storage.

Alfalfa growing became better adapted to market requirements after the promulgation in 1925 of United States standards that gave definite recognition to the importance of leafiness in alfalfa. Inspections showed that the grade of much alfalfa hay was lowered by overripeness at the time of cutting or by harvesting methods that shattered the leaves. They showed also that producers allowed their alfalfa hay to suffer much preventable damage. Accordingly, the department and the State agricultural experiment stations organized research and farm-management programs in the chief alfalfa-producing areas with substantial benefit to the alfalfa industry. Within a few years the grade and feed value of alfalfa hay in several areas improved materially.

Cotton Grade and Staple Estimates

Opportunities to improve the quality of cotton grown in the United States and the importance of reflecting quality differences more accurately in prices paid to growers at country points drew renewed attention as a result of the department's cotton grade and staple estimates reports and cotton-price studies begun by the department four years ago.

The department compiles data by States and districts, so that the grades and staples of cotton grown in various localities can be compared. The grade and staple estimates for 1931–32 showed that 89.4 per cent of the cotton crop was tenderable under the cotton futures act, as compared with 84.6 per cent in 1930–31. Price data gathered in 1931–32 represented more than 30,000 individual bale sales in more than 45 local markets. The information showed that in many cases prices paid to growers do not vary appreciably with the grade and staple of the cotton. This discourages quality improvement. In the 1930–31 season some farmers received considerably higher prices for low grades and short staples than other farmers received for higher grades and longer staples on the same days. Differences in classification, in bargaining power, and in other factors largely accounted for these variations.

The grade and staple estimates, with the related price studies, afford a logical and constructive approach to quality-improvement work. They show the grade and staple length of cotton produced not only in the country as a whole, but in different parts of the Cotton Belt. Hence they indicate what sections are relatively best suited to produce cotton of different grades and staple lengths. The department furnishes individual gin reports to cotton-gin owners and to the State agricultural experiment stations. Thus information about the cotton crop becomes highly particularized by localities. Combined with information on cost of production it aids communities and individuals in deciding how they may profitably modify their cotton-production programs.

Growers need facts about the consumption as well as about the production of cotton. The department collects data showing the grade and staple lengths of the cotton consumed by American mills. The consumption reports, analyzed in connection with production facts, show to what extent the growers satisfy mill requirements. Certain of

the grade and staple lengths produced in the United States depend more on the foreign than on the domestic market. The production and consumption reports indicate the proportions in which cottons of different grades and staple lengths go abroad. This knowledge bears significantly on farm practice. The United States exports more than half its cotton. Production of the different grades and staple lengths should be adjusted to the total demand, and not merely to domestic standards of consumption. The market wants cottons of different qualities and different staple lengths. It wants these cottons in different amounts. Profits in cotton production depend largely on the success with which growers adjust their output to these different requirements. It is first necessary to know precisely what the requirements are. This need the department endeavors to meet with its grade and staple estimates reports and cotton-price studies.

RESEARCH IN THE STATE EXPERIMENT STATIONS

This department administers acts that provide Federal aid to the State agricultural experiment stations in the amount of $4,320,000 annually. These stations are under the immediate direction of the respective States and receive an average of about $3 of State funds to each $1 of Federal funds. Federal law requires the department to *cooperate with the stations in supervising the expenditure of the* Federal money. The research of the department is coordinated with that of the State stations. The department and the States cooperated during the year in about 1,100 research projects. Every State participated.

Recent contributions to agriculture by the State experiment stations illustrate the use made of the Federal funds. These contributions deal with problems of soil fertility, of farm management, of animal and plant disease control and insect control, of distribution and marketing, of quality improvement, of harvesting methods, of processing and storing, of utilizing surpluses and by-products, and of farm living standards.

After many years' experimentation, the Massachusetts experiment station recently matured and reported a method of using fertilizers profitably to improve stony upland pastures. There is a large and increasing area of such lands in the United States. Certain cotton soils of the South are becoming unproductive because of the long-continued liberal use of calcium arsenate to combat the boll weevil. The South Carolina station reports that such soils can be restored to productivity simply by applying iron sulphate, which fixes the arsenic and neutralizes its effect. The Oklahoma station recently reported experiments which show terracing to be effective in conserving soil moisture and increasing yields even on practically level land. Accurate and equitable distribution of irrigation water is an important public concern in irrigated regions. The Colorado station recently perfected a measuring flume which appears to excel in accuracy and dependability those heretofore commonly used. This flume is rapidly coming into general use.

The experiment stations have originated numerous improved varieties and strains of field crops, fruits, and vegetables. Farmers and fruit growers of New York, Minnesota, and many other States are generally growing fruits, grains, and other improved crops developed by the stations, with gains running into millions of dollars annually.

More than 90 per cent of Montana's wheat acreage is planted to varieties recommended by the Montana station. One variety, Montana 36, developed by the station, has practically displaced all others in the Gallatin Valley. From the native sand cherry and other wild species, the South Dakota station has originated valuable hardy fruits adapted to the severe conditions of the Northwest. Recently it developed a hardy apple of superior value for South Dakota conditions. A seedling strawberry of superior quality, the McClintock, originated by the Tennessee station, was recently released to commercial growers. The Corvallis strawberry, developed and introduced by the Oregon station, has been received with favor by commercial growers.

Cooperating with the department in a study of the possibility of developing the domestic production of sugar-beet seed, the New Mexico experiment station found that under the mild climatic conditions prevailing in the Rio Grande Valley, seedlings from seed planted in the fall may be overwintered in the field and brought to satisfactory seed production the succeeding year. This method speeds seed production and reduces its cost. Its economic importance is indicated by the fact that American farmers pay more than $2,000,000 annually for sugar-beet seed, mostly to foreign seed producersand distributors.

Wilt, one of the most destructive diseases of cotton, the Arkansas station finds, can in large measure be controlled by liberal use of potash fertilizers, which also reduce injury from rust, stimulate growth, and increase yields. As a result of investigations by this and other stations, wilt-resistant strains of cotton are now available to the grower. The North Carolina station finds that at a cost of less than 16 cents per acre for spraying with Bordeaux mixture, the heavy losses sustained by sweetpotato growers as a result of wilt or stem rot may be prevented.

The Kansas station has found a strain of hard red winter wheat which is resistant to the Hessian fly and is as good as other improved winter wheats. The Michigan and Ohio stations are developing strains of corn having good quality and yield and resistant or tolerant to the attack of the corn borer. Methods of culture which greatly reduce the damage done by the borer have been developed.

"Salt sick" is a cattle disease estimated to cause a loss of more than $3,000,000 annually in Florida. The Florida experiment station reported that it is a mineral-deficiency disease which can be prevented by giving the cattle access to a relatively cheap mixture of common salt, red oxide of iron, and finely ground copper sulphate. Several stations developed and demonstrated new methods and vaccines for control of fowl pox, a widespread and destructive disease of poultry. For sore mouth, an infectious disease of sheep and goats, the Texas station developed and put into practical use a vaccine which effectively prevents the recurrence of heavy annual losses to ranchmen.

The Oregon experiment station reported perfecting an electrical device that accurately determines the degree of ripeness and the time of picking that will insure winter pears of the best market quality. Refrigeration costs can be greatly reduced by a method, recently announced by the Massachusetts station, of storing apples at a relatively high temperature for a month after harvesting and then reducing the temperature to 32° F. The Georgia station in investigations on the preservation of fruits by quick freezing achieved results of

value not only to producers and housewives but also to the frozen-fruit industry. The investigations showed the kinds of fruits best suited to the process, and its effect on the final food value of the product.

The Rhode Island station reported experiments showing that potash fertilizers, particularly the muriate, increase the mealiness and improve the culinary quality of potatoes. Many other examples could be cited from the work of every State experiment station. A more complete account of accomplishments will be presented in the annual report required by law on the work and expenditures of the State agricultural experiment stations.

LAND-USE PLANNING AND CONSERVATION

LAND UTILIZATION

For years economists, scientists, and administrative leaders in the department have said that we need a new land policy for American agriculture. The present depression gave poignant emphasis to that need. The panorama of overproduction, serious maladjustments in taxation and credit, a radical transformation in the geography of production, a changed outlook with regard to population increase and land requirements, all pointed to the need for action.

I found last fall that the department's convictions on this question were shared in most essentials by leaders of the national farm organizations, by most of the membership of the Association of Land Grant Colleges and Universities, by influential agricultural editors, by State secretaries of agriculture, and by many other groups. The time appeared ripe for a renewed effort and new emphasis. Accordingly, in November 1931, I called a national conference which met at Chicago to discuss the formation of a land-use program. It was attended by 350 representatives of various agricultural organizations.

The conclusions reached at the conference, the actions subsequently taken by committees set up at the conference, and the widespread interest shown in many States, give promise that we shall replace this country's traditional policy of planless agricultural development with a comprehensive and thoroughly integrated program of land utilization. This program will, as it gathers force and cooperative support, lead the way toward a reconstructed, cohesive American agriculture.

This program envisages: (1) A better economic utilization of our land resources, (2) control of erosion, (3) a far-sighted provision for future timber and public recreation needs, (4) preservation of wild life, (5) the gradual diversion to other purposes of lands submarginal for farming, (6) guidance of proper enterprises in land settlement, and (7) important adjustments in governmental organization in the distribution of local institutions and in local taxation and expenditures—adjustments that have become or will become necessary as important changes in land use are made.

Department a Pioneer in Land Utilization

This is not an emergency program. Its various elements are not new. In many fields the department has for years been developing the factual basis for a national land-use policy. As long ago as 1923 the department outlined the essentials of such a program. I

called attention to the more recent developments in my 1930 and 1931 annual reports.

Particularly in the domain of lands for forest use and for wild-life refuges, the department has partly translated its ideas into action. It is now responsible for 161,360,691 acres of national forests. On this vast acreage the Forest Service efficiently protects and manages the timber and grazing resources and aids in the stability of stream flow. It promotes game conservation and forest recreation. It shows how to make forestry a good form of land use and how to utilize the products of the forest to best advantage. It cooperates with the States in the promotion of forestry under the Weeks, Clarke-McNary, and amendatory laws.

Another unit of the department—the Bureau of Biological Survey—has developed a comprehensive system of wild-life refuges. It is encouraging adequate protective measures for wild life on both private and public lands.

Research in the department has been making available a body of information vital to the formulation and application of sound land-use policies. The Bureau of Chemistry and Soils in cooperation with State agencies has analyzed, described, and mapped more than half the Nation's agricultural area as a basis for more intelligent land use. It has attacked the problem of soil erosion and other causes of soil depletion. The Forest Service is concluding an extensive investigation of the intricate problem of forest taxation. It is conducting a nation-wide survey of forest resources, a survey already well advanced in the Douglas fir region of the Pacific Northwest and in parts of the South and begun in other regions. This survey will provide information about the stand and condition of timber of various kinds and ages, the rates of timber growth, the extent of the present drain on timber supplies, and the probable future requirements for forest products. The Bureau of Plant Industry with its introduction of new plants—some of which form the basis of new agricultural industries—and its extensive plant-breeding and related studies has greatly influenced the modern trend of agricultural products; this is true both of the staple crops and of fruits and vegetables.

The Bureau of Agricultural Engineering has made significant technological contributions in regard to clearing, draining, and irrigating lands. It has added to our knowledge of how to make a more efficient use of water. The Bureau of Agricultural Economics has been studying land resources and land utilization, settlement, tenure, and land values. This work has clarified the national outlook on the relation of land supply to potential requirements, emphasized the significant interrelations of the various uses of land, and indicated the need for a coordinate land-use planning program.

These advances in administration and research represent a substantial beginning. Our experts and, I think, the general public recognize, however, that many gaps still need to be filled before we can say we have achieved a definite program of planned land use. This is especially true of our farm-land policies. Here, perhaps more than in other fields, we find that the policy generally pursued in this country has been a policy not of land use but of land exploitation. And it is especially in this phase of the land problem that the depression has emphasized the weakness in no uncertain way.

Farm Plant Too Large

For a decade before the onset of the depression American agriculture was handicapped by an overextended plant, which included a good deal of land ill adapted to present-day requirements. This situation conflicted sharply with the need for reducing production in some important branches of agriculture and for reducing the average cost of production.

Our outworn homestead policies were partly responsible for bringing extensive areas into farming during and immediately after the World War. In many cases the area per homestead was too small for efficient use. Many a homestead would not maintain a family. *A great deal of the land was too poor to meet the shocks of drought and depression.*

Much inferior land came into cultivation during and immediately after the war and remained in the farm plant after the stimulus of high commodity prices had passed.

In various parts of the country a good deal of privately owned land not suited to farming was sold to settlers. Numerous private and public reclamation projects, many of them ill advised, were launched.

Moreover, the mechanization of agriculture and a general shift toward the use of lands of more favorable topography have tended to displace numerous farms handicapped by small, broken, and steeply sloping fields and by impaired soil fertility. The cutting away of the forests has impaired the economic strength of numerous communities. This has reacted unfavorably on agriculture by destroying local markets, eliminating opportunities for supplementary employment, and narrowing the tax base to shoulders less able to bear the burden than they were before.

Submarginal Lands and Tax Delinquency

As a result of these and other conditions, numerous farms are now submarginal. Private owners of extensive areas of cut-over land find that these lands are no longer worth retaining. Along with these conditions, and because of mounting property taxes, has come an inevitable and rapid increase in tax delinquency. Already millions of acres are delinquent. If our agricultural plant remains disorganized and if farm commodity prices do not rise materially, more millions are destined to become delinquent. About 20,000,000 acres in the three Great Lakes States are in some stage of tax delinquency. Extensive tax delinquency has developed also in parts of the South, in the Great Plains, in the poorer sections of the Ohio Valley, and in other parts of the country.

To what extent these large areas of tax-delinquent land include land suitable for farming is not known; present data do not permit definite differentiation. It is certain, however, that in the Great Lakes States especially, the larger part of the tax-delinquent land is in the so-called cut-over regions. Most of this land never was in farms, although when the timber was removed it was hoped that the land could be utilized for farming. Much of the present tax delinquency is a direct result of the drastic decline in agricultural income everywhere. When economic conditions improve and returns in farming increase materially, tax payments on a large part of the land now delinquent will be resumed by the present owners. Some of the land that has been

offered or will be offered for tax sale will be redeemed within the redemption period provided by law in the several States. Land to which full title is transferred to private parties before material recovery occurs in agricultural income probably will continue in private hands, especially if it is fundamentally suited for farming.

Even granting that a large part of the present tax delinquency is due to causes directly resulting from the depression, it remains true that a vast amount of the delinquency is due to fundamental maladjustments in the utilization of land unsuited for farming even in normal times and incapable of paying taxes to support necessary public improvements, schools, and other basic elements of community life. Such land is destined to chronic tax delinquency, if not already delinquent, and will ultimately revert to public ownership. Considerable areas of delinquent land have already been taken over by States and counties. This presents an acute problem of land-use planning, readjustment in taxation, and reorganization of rural government and institutions.

Drainage and Irrigation Districts

Another challenge to constructive action is the plight of numerous drainage and irrigation districts that find themselves in financial difficulties. In 1930, 35 States had organized drainage enterprises covering 64,409,000 acres. The investment in those enterprises was $680,733,000. They were undertaken to bring land into cultivation. This object was realized only in part, for some of the projects were ill advised and all of them were seriously affected by the depression. One State with more than 5,000,000 acres in drainage enterprises in 1929 had less than 7 per cent of that area in farms, and less than 4 per cent of it in crops. In three other States less than half the land in drainage enterprises was in farms. In eight States less than half the land in drainage enterprises produced crops in 1929. Even in 1929 there were no crops on nearly 30,000,000 acres, or about 35.5 per cent, of the total area in drainage enterprises in the United States. Enterprises covering a total of 9,813,000 acres were in arrears in their payments of interest or principal. Tax payments were delinquent on 10,051,000 of the 64,409,000 acres in the drainage enterprises in the United States. In one State, tax delinquency covered 51 per cent of the area in drainage enterprises, and in another State 24 per cent. Still another State recently has undertaken to assume the obligations of thousands of acres mistakenly drained, and expects to devote the land again to game and fish, to which it should have been left in the first place. This situation has grown much worse in the last two years.

Like conditions exist in certain irrigation districts. Even in 1929, out of 26,000,000 acres in irrigation districts which could have been supplied with water, 25 per cent was not irrigated. Of 19 States containing irrigation districts, only 8 irrigated as much as three-fourths of the area capable of being supplied with water under irrigation facilities then existing. In one State, payments of interest or principal in bonds were past due on January 1, 1931, in 19 out of 85 irrigation districts. In three districts more than two-thirds of the taxes levied for the years 1927–1930 remained uncollected. In another State 13 districts out of a total of 48 were in default.

Those distressed districts that are capable of holding their own in agricultural competition probably will need to undergo a process of financial reorganization. The Federal and State Governments may perhaps find ways of assisting in the necessary fact finding and perhaps in the repair or restoration of indispensable drainage and irrigation work.

Movements of Population

Movements of population between town and country affect the land problem. Population normally ebbs and flows between town and country. It is the net balance that is significant. From 1920 to 1929, the balance ran heavily in favor of the cities and towns. In that period, the yearly net outflow from farms to cities and towns ranged from 336,000 to 1,137,000 persons. In 1930, however, there was a net inflow to farms of 17,000 persons. There was the usual rural excess of births over deaths. Consequently, the total farm population, for the first time in at least a quarter of a century, increased significantly. It increased again in 1931, during which year the country-ward flow was 1,683,000 and the city-ward flow was 1,469,000.

Urban unemployment obviously had much to do with this change in the movement of population. Whether the change will persist after industrial employment revives remains to be seen. Unquestionably, however, it creates new problems for rural communities, and has an important bearing on the land-use problem.

Besides the spontaneous movement of population from cities and towns to the country, there is talk of concerted effort to place unemployed city people on the land. Such projects should not be undertaken lightly. Merely to shift the problem of relieving want is not necessarily to solve it. Moving needy folk from towns and cities to the country may throw a burden on rural communities without simplifying the unemployment problem. People, of course, have a right to move about and to seek opportunity wherever it may exist. But it is another thing publicly to encourage a movement that may have no sound economic foundation. In any event, the movement should be guided in the light of the best information available in order to protect the interest of those who may move to the land and to protect rural communities against having the problem of urban unemployment shifted to them.

People ignorant of agriculture and rural life often think farming is easy. Usually they are disappointed. Commonly, the unemployed city dweller seeking land gravitates to the submarginal areas—to precisely the areas that should not be farmed. The deceptive cheapness of such land attracts him. Encouraging inexperienced people to go on land that others have abandoned or on land manifestly unsuited to agriculture is neither sensible nor humane. It does not permanently relieve unemployment and checks the development of a rational land-utilization policy.

There are opportunities to absorb unemployed people into agriculture. Thousands having country connections have already returned, and others will do so. In some cities vacant lots and plots of land have been helpfully turned over to unemployed families for gardens. There is a movement of industrial workers to suburban homes with land enough for production of some food. This movement will continue and should be encouraged. But mass migration from the

city to the country is another story. A movement large enough to materially diminish urban unemployment would create serious rural problems. It would go squarely against the need to put our land-use system on a rational basis.

Recommendations of National Land Conference

These essentially interrelated problems, and others that I have not mentioned, were considered by the agricultural leaders who attended the national land utilization conference in Chicago. The delegates fully recognized the need of defining our national objectives, agreeing on proper policies, and then promoting concerted action among public and private agencies. The discussions and the conclusions reached at the conference constitute an important step toward a planned agriculture.

The conference recommended that new irrigation and drainage projects be postponed, counseled the withdrawal of marginal or submarginal land from homestead entry, and proposed the licensing and regulation of land-development enterprises.

It called for a national inventory and classification of our land resources.

It emphasized the need of tax reform in relation to changed conditions of land utilization, particularly in areas now distressed by tax delinquency.

It recommended the Federal regulation of grazing on the public domain, urged the consolidation of school lands through exchanges, and advocated more adequate measures for watershed protection, particularly in the public-land States.

It drew up a list of objectives which it held should govern in the public acquisition of land.

It recommended the coordination of various credit agencies engaged in making loans to farmers, endorsed the department's outlook reports as a basis for land-use planning, and advocated an expansion of the department's soil-conservation program. It called for additional study of land-utilization problems arising from regional competition and from the decentralization of industry.

Committees to Carry Program Forward

To provide continuing machinery to formulate objectives and policies and to promote consideration of these by the public and private agencies concerned, the conference recommended the establishment of two national committees to be known as the national land-use planning committee and the national advisory and legislative committee on land use.

These committees were organized in the early spring of 1932. The land-use planning committee is made up of the chiefs of eight bureaus in the Departments of Agriculture and Interior primarily concerned with land utilization, together with a member of the Federal Farm Board, a member of the Federal Farm Loan Board, and five representatives appointed by the Association of Land Grant Colleges and Universities. Thus the committee is especially competent to integrate the efforts of various official agencies concerned with land. The advisory and legislative committee is composed of representatives of the major farm organizations, associations concerned with forests and

conservation, and other national organizations that have a direct interest in the land problem.

These committees have been at work since their initial meeting in February, 1932. They have already made notable progress in defining objectives, arranging for assembling the extensive factual basis necessary to the development of sound conclusions, formulating tentative policies, stimulating local interest in adequate land-use adjustments, and aiding in the development of coordinated land-use planning programs in individual States. The committees have enlisted the aid of the foremost experts on various phases of land use by forming a number of advisory technical committees.

It is too early to outline in detail the specific program of land use that will emerge from these efforts, but a survey of the range of activities of the national committees emphasizes the far-reaching and helpful adjustments they have under consideration. While making plans for the long-time task of developing a comprehensive program, the committees have properly given initial attention to some of the immediate and pressing questions growing out of the present emergency. Among these is that of tax delinquency, to which I have already called attention.

In a large proportion of the States the legal procedure for taking over tax-delinquent lands needs to be simplified. Steps should be taken to classify the land to determine: (1) For what purposes the various classes of land should be used, (2) the advisability of permanent retention in public ownership, and (3) by what agencies these lands should be administered.

The committees recognize that heavy and ill-balanced taxation and drastic curtailment of income of landowners are largely responsible for tax delinquency. This in turn results in a shrinkage of the tax base, which further aggravates the tax problem. Consequently, steps must be taken to broaden the tax base. At the same time economies and readjustments in the structure of local government must be made in the light of modern conditions of transportation and other phases of community life, and as logically indicated by extensive changes in land utilization and ownership. Since severe competition between the Federal Government and the States for the various available sources of revenue has developed, the committees consider that a better-coordinated system of Federal-State taxation is essential. To this end they have endorsed the Davenport resolution of the last session of Congress as a concrete step toward that objective.

The problem of idle lands is of Federal as well as State concern. The committees, therefore, are trying to develop a Federal-State program of land-use planning with immediate reference to the areas where tax delinquency is most prevalent. They aim to promote the coordination of the efforts of the various Federal and State agencies in this undertaking. A beginning has been made in two States—Georgia and Minnesota.

The committees have considered carefully the problem of the back-to-the-land movement. A statement dealing with this subject was prepared and given wide distribution through the President's Organization on Unemployment Relief and through other channels. The statement recognized some possiblilities of relief through the establishment of gardens in or near cities. It declared sound the tendency toward the decentralization of industry and the coordination of urban

employment with residence in suburban areas for the purpose of producing subsistence. On the other hand, the statement warned that there are dangers in ill-advised attempts at sporadic settlement or colonizing of the unemployed on vacant lands, and stressed the importance of developing adequate facilities for guiding the movement along sound lines. To this end a bill, providing for the collaboration of this department with other Federal departments and State and local agencies in the guidance of those seeking relief by land settlement, was passed by the Senate but failed to pass the House in the last days of the session. Some measure of this kind is worthy of serious consideration.

The land-use committees are working on a number of other significant problems of adjustment. Steps have been taken to develop through the cooperation of Federal and State agencies a classification of the lands of the United States from the standpoint of physical adaptability to the major uses of land. Technical advisory committees are studying various measures proposed for handling the public domain; the problem of financial reorganization of distressed drainage and irrigation districts; the objectives and scope of public land acquisition and the place of various governmental agencies in a program of acquisition; the proper disposal of foreclosed farm lands; the possibility of replacing seed loans with a sound system of production credit; the needed adjustments in systems of farm organization; and the steps necessary to prevent erosion and conserve soil, timber, water, and wild-life resources.

Committee Work Voluntary

The members of the committees serve without salary. They command only such resources as they can enlist through the services of existing agencies. They nevertheless represent the first and only distinct means of coordinating all efforts in solving the problem of land utilization—a coordination essential to the rebuilding of our rural civilization. The task will be long and tedious. But a beginning has been made. Already a number of States are developing State land-use programs and are coordinating them with the national program.

The last annual meeting of the American Association for the Advancement of Science gave serious consideration to this problem. The national and regional farm press is throwing its powerful influence behind the movement.

We have laid aside the expansionist philosophy carried forward from the pioneer epoch. We are turning now to sound economic planning in agriculture.

SOIL EROSION

Erosion has practically destroyed for American agriculture more than 21,000,000 acres of land formerly in cultivation. Gullying is the visible evidence of the destructive effect of unrestrained rain wash. But the impoverishing effects of sheet erosion are far greater than those of gullying. This slow process, which carries away a part of the soil during every heavy rain, is gradually diminishing the productive capacity of 75 per cent of the crop land in the United States. All the crops grown in the United States annually remove about 6,000,000,000 pounds of plant food from the soil. Erosion annually removes about 21 times as much.

Some 500,000,000 tons of suspended material are discharged into the sea by rivers every year. What reaches the sea is the finest, most minute material. The heavier sand, pebbles, and rocks are stranded somewhere along the way to form sand bars, new river bottoms, or new banks. For every ton of sediment that reaches the sea, at least 2 tons are stranded along the way. At a conservative estimate, 1,500,000,000 tons of eroded material get into our river channels and into the sea every year. To replace all the plant food thus lost would, at current fertilizer prices, cost millions of dollars annually. No nation in history has permitted its farm lands to waste away as rapidly as has the United States. Our agriculture can not withstand such losses indefinitely.

New Program to Combat Erosion

Three years ago Congress placed on the department the responsibility of working out means for checking these appalling national losses. In cooperation with the States the department immediately initiated a campaign, national in scope. Experiment stations were established in regions where the problem is most serious. Research conducted at these stations has produced significant results, particularly in developing practical measures to slow down or control erosion losses. Further, the department has aroused farmers to a realization of the cost of this form of land depreciation. They are widely adopting the improved practices announced by our research workers.

Assistance to the Corn Belt

It takes nature not less than 400 years to build up 1 inch of the rich topsoil characteristic of the rolling parts of the Corn Belt. By planting corn continuously in that area, man has permitted erosion to remove that inch of topsoil in from 10 to 50 years, depending on the steepness of slope. The average depth of topsoil in much of this region is about 7 inches. In other words, 2,800 years of soil building by nature is destroyed by man in little more than two generations. In certain sections of the Corn Belt, forms of terraces improved by our scientists are controlling this washing away of the fertile soil from cultivated lands. During the heavy rains of the past season losses on unterraced areas under observation are estimated to have been from 50 to 100 times as much as losses on areas protected by terraces.

For use in areas of limited rainfall there has been developed a cultivator that digs 10,000 holes per acre. On lands of gentle slope, in addition to preventing soil washing, these holes hold back and conserve the rain water to the extent of 20,000 to 30,000 gallons an acre. This scarification process, which can be done as cheaply as ordinary cultivation, enormously increases the absorption of water and at the same time reduces erosion losses. The loss of rain water from areas in western Kansas cultivated with this machine has amounted to only 1.5 per cent of the total precipitation as against 34 per cent from untreated areas immediately adjacent. This machine will undoubtedly find an important place in the Nation's program of soil conservation.

An inexpensive method of controlling small gullies has been worked out and is being rapidly adopted by farmers. It consists of filling

old fertilizer sacks with sod and placing them in the bottoms of shallow washes. The grass roots go through the sacks, take hold of the ground and quickly establish effective dams.

Strip Cropping and Other Developments

In a number of regions, strip cropping as a supplement to terracing has been tried out with highly satisfactory results. This practice consists of running terrace lines, plowing along these lines and then, where the terrace would otherwise be constructed, planting strips of densely growing feed or grain crops which tend to arrest the loss of soil and water. In the South, cotton and other row crops are planted on the contours parallel to the strips; thus each row serves as a miniature terrace to check the flow of water and to cause more of it to sink into the soil. As soon as the crop on the strips is harvested the land it occupied is available for terrace construction, making it possible to terrace during late summer and fall when usually there is ample time for such work. Many farmers, though realizing the urgent need for protecting their land, do not find the time opportune for constructing the needed terraces. The planting of soil-saving strip crops is very simple and involves practically no additional farm expense. The strips give considerable protection to the land and preserve the terrace lines so that the structures may be built at a later date.

Investigators have found that vegetation of the thick-growing type enormously slows down erosion and run-off and that the humus added to the soil in crop rotations also very materially lessens the losses. These findings show that soil-holding and water-retaining crops must be given a more important place in the agriculture of some regions if soil productivity is to be maintained.

In the South Atlantic and Gulf States the value of winter cover crops as a supplement to terraces has been demonstrated. In the piedmont sections of North Carolina bare plots are losing soil 80 times more rapidly than similar plots on which Lespedeza is being grown. Moreover, the plot covered with Lespedeza has lost only 9 per cent of the rainfall as against 26 per cent lost by the bare plot.

Accelerated erosion causes great damage to some of our major watersheds. On the Rio Grande watershed in New Mexico, serious gullying in addition to excessive sheet erosion occurs on 35 per cent of the drainage area. On the Colorado River in Utah, Colorado, and Wyoming 50 per cent of the drainage area shows such erosion.

Investigations have showed that the litter on the ground beneath the forests helps the soil to absorb water and so to reduce run-off and erosion. California tests demonstrated erosion from bare soils to be as much as 3,500 times greater than that from litter-covered soils and the surface run-off to be as much as 24 times greater. A forest-covered watershed preserves the regularity of stream flow and furnishes water free from silt.

Erosion is responsible for a startling reduction in the underground water supply. It is this reserve water supply that makes stream flow possible and farming feasible, and sustains production and population in the greater part of the settled country.

By depositing silt in the streams, erosion pollutes them, and menaces public health, fish life, and fishing industries.

163050°—33——5

Erosion can be held largely accountable for disastrous floods on the one hand, and drought on the other.

Silt deposited in major streams can render great investments in power and irrigation reservoirs useless after a very few years. It can likewise impede navigation during low stages of water and aggravate flood conditions at high stages.

Much Erosion Preventable

Research shows that much of this damage to our soil and our water supply can be prevented. We can so alter cultural methods in farming as to increase percolation of water into the soil, returning to the soil every available bit of organic matter, terracing and strip cropping to impede the rate of run-off. Gullying can be prevented by soil-saving dams. Cultivation on slopes of more than a given steepness can be suspended. Pastures too steep to be grazed without erosion can be converted into wood lots, or at least allowed a rest from too-intensive grazing. We can make it a matter of general policy to discourage the cultivation or overgrazing of lands too steep to escape erosion except when protected by a cover of vegetation.

It may be wise to develop our national-forest policy to provide for maintenance of a dense forest or grass cover on critical watersheds that have regional or national importance. When State and national finances permit, it may be wise to extend our forest policy to cover soils subject to excessive erosion. Similarly, grazing must be regulated on the western ranges of our remaining public domain in order to prevent disastrous erosion.

It is high time we stemmed the destructive tide. Because land scarcity has never been a problem with us, because overexpansion of the cultivated area is even now a blight on our agriculture, we can not therefore ignore soil erosion. There is neither economic gain nor social wisdom in permitting our land resources to be heedlessly destroyed, regardless of whether our land supply is scarce or abundant. Though there are millions of acres of arable land still unfarmed in this country, much of it would require costly drainage, irrigation, or clearing. As we now see the future, a sound national policy of land use does not call for expansion of our cultivated area, least of all by these costly means. It would be poor economy to allow our established farms to deteriorate, simply because other lands could be had.

Erosion strikes at the vitals of civilization. It is the problem of the farmer, the fisherman, the builder of waterways and reservoirs, the business man, the legislator—the problem, in short, of every thinking citizen of the Nation. In part an individual problem for the farmer, it is also in large part a problem for community, State, and national action. In the permanent improvement of waterways and water supply, in the conservation of soil resources, in our attempts to achieve a balanced agricultural production, and to maintain an industrial civilization, our efforts must begin on the land.

It is for that reason that a sound national policy of land utilization—of which erosion control is a vital part—is so basic to a solution of our major agricultural problems.

The interest being displayed by farmers in the regions where the department's erosion control work is being conducted gives ample proof that the move made by the Government to stop this devastating waste is being recognized as a major one to save for agriculture its

basic resources. In Texas alone during 1931 more than 1,000,000 acres of crop land were terraced.

NATIONAL FORESTS

One-fourth of the land area of the United States is forest land. The department is directly concerned with the problems of rehabilitating, protecting, and developing all the resources on this vast acreage, whether it be publicly or privately owned.

So far as the national forests are concerned, they are being so administered as to maintain and develop their resources for the benefit of the general public. During the year the gross area of the national forests was increased by 963,674 acres and the net area by 573,004 acres, so that the department is now managing a total of 161,360,691 acres for the production of timber and the stabilization of stream flow. The major increases resulted from the acquisition of 98,832 acres by land exchanges and of 362,075 acres by purchases under the Weeks law and the Clarke-McNary law, at an average price of $3.34 per acre. Since the Weeks law was approved on March 1, 1911, the National Forest Reservation Commission has approved the purchase of 4,727,680 acres of forest land at a total cost of $21,203,021.93, or an average of $4.49 per acre. The national forests are 147 in number and are situated in 32 States and 2 Territories.

Increased activity in forest planting occurred during the year, the total area reforested by all agencies, Federal, State, and private, amounting to 155,266 acres, as compared with 138,970 acres in the preceding year. Artificial reforestation work during the year covered more than 26,000 acres of national-forest land. Although this was only a fraction of the total area in need of planting, it was the largest ever planted in the national forests in one year. This accomplishment was largely due to lower planting costs per acre. In addition, the department cooperated with 37 States and 2 Territories in producing and distributing trees to farm owners for reforestation of farm woodlands and for windbreak and shelterbelt planting. More than 25,000,000 trees were distributed under this project.

The national forests last year provided recreation for 32,228,613 persons—the largest number of visitors ever recorded. Nearly 8,000,000 of them visited the forests for camping or picnicking, or as hotel and resort guests; the remainder were transient tourists.

Forest-Fire Protection

Forest-fire protection becomes increasingly effective in the United States. In recent years weather conditions have been adverse. In fact, in every year except one since 1918 there has been a shortage of rain and snow in the national forests. Yet in 1930 the area burned on the national forests was the smallest since they were established. In 1931, though unusual drought prevailed, the national-forest area lost by fire was only slightly more than the average loss for the previous five years. With so much unemployment in the country, the danger of forest fires from carelessness and incendiarism is greater than usual. The emergency measures taken, however, have so far been effective. The department has developed new technical processes and mechanical aids for fighting fires. It has constructed extensive improvements to facilitate forest protection, including truck and horse trails, telephone lines, lookout structures, and other devices.

It conducts education to impress users of the forests with the necessity for being careful with fires.

Cooperation with the States and with private forest-land owners during the year extended fire protection to 243,039,125 acres of private forest lands. More than 216,000,000 acres, however, were still without organized protection. It is significant that more than 87 per cent of the country's total acreage losses from fire last year were on lands that do not have organized protection.

Grazing Fees Reduced

As a measure of relief to the livestock industry in the Western States, the department reduced the fees for grazing livestock on the national forests by 50 per cent for the year 1932. Users of the national forests benefited by more than $1,000,000. The number of livestock grazed on national-forest ranges did not decline substantially during the year, though the number of livestock in the country as a whole declined. The department provided 25,700 permittees with range for nearly 14,000,000 domestic animals.

Part of the money appropriated for the administration, protection, and improvement of the national forests assisted the range livestock industry. Approximately $120,000 was used for range improvements.

WILD-LIFE REFUGES

The third year of administration of the migratory-bird conservation act of 1929, providing for the acquisition of lands for migratory-bird refuges, witnessed constructive accomplishments. The Migratory Bird Conservation Commission authorized the department to lease or purchase 40,978 acres for bird refuges, and Executive orders recommended by the department withdrew 42,984 acres of public domain for the same purpose. The department has now purchased 79,793 of the 139,981 acres thus far authorized to be acquired, and has 34,326 acres under lease pending title conveyance. In addition it has acquired 114,572 acres, chiefly by cession, gift, and Executive order, making a total of more than 250,000 acres thus far acquired or in process of acquisition under the refuge program. At the close of the year there were 16 refuges established in 14 States, at an average cost to the Government of $4.38 an acre. Every major area in the United States of importance for migratory-bird refuge purposes has been examined, and all but eight States have passed acts enabling the Federal Government to acquire refuge lands within their borders.

Within the national forests there are 289 State game refuges and 24 Federal refuges, which have a total area of 23,868,817 acres. Under this protection the game is steadily increasing and the resource is providing larger incomes to the States and local communities from the fees for hunting. The census of game animals in the national forests in 1931 showed 12,725 antelope, 50,596 black or brown bears, 3,747 grizzly bears, 969,330 deer, 96,905 elk, 7,835 moose, 22,262 mountain goats, and 12,555 mountain sheep.

In addition to the refuges on national forests and to those being acquired under the migratory-bird conservation act for the protection of game birds, there are under the jurisdiction of the department nearly 100 areas that serve to protect the breeding and feeding grounds of sea birds and other interesting species and to conserve big-game

and fur animals. These areas have for the most part been reserved from the public domain, though some have been enlarged by acquisition of private holdings as authorized by law.

Among the larger of these is the Bear River Migratory Bird Refuge, Utah. This is an area of 64,255 acres on the north shore of Great Salt Lake, the boundaries of which were established by Executive order of September 26, 1932. Game birds that concentrate on these marshes frequent also 14 adjacent States in the Great Basin and Rocky Mountain region and travel as far away as Canada and Mexico. The Upper Mississippi River Wild Life and Fish Refuge, which extends for 300 miles on both sides of the river in the four northernmost States of its course, is administered jointly by this department and the Department of Commerce. Smaller bird refuges are maintained by the department in important parts of the former domain of the various species along coasts, inland waterways, and elsewhere in the United States, and in Puerto Rico, Hawaii, and Alaska.

SERVICES GROWING OUT OF RESEARCH

Numerous service functions grow out of the department's research. Thus campaigns to eradicate or control animal and plant pests are based upon research. Educational extension is the application of research; it begins with research and becomes a service activity in the extension process. Crop reporting obviously involves both research and service. It is the same with plant-quarantine work, wild-life conservation, forest protection, seed verification, meat inspection, and many other activities.

How research develops into service appears strikingly in the work of the Weather Bureau. This bureau forecasts the weather, issues storm warnings, displays weather and flood signals for the benefit of agriculture, commerce, and navigation, and maintains a network of reporting stations to assist aviation. All this depends on meteorological science.

FOREIGN AGRICULTURAL SERVICE

One of the most notable advances in service work in recent years is the department's efforts to aid agriculture dispose of its exportable surpluses by supplying through its foreign agricultural service valuable information on foreign-market opportunities, preferences, supply, demand, prices, and so on.

American agriculture is adjusted to produce heavily for export. In recent years the United States has exported about half its cotton, a fifth of its wheat, half its rye, a third of its tobacco, a third of its lard, and substantial proportions of its rice, pork, and fruit. No matter how much may be done to keep surpluses within bounds, it goes without saying that this country will want a foreign outlet for many products indefinitely.

In times like these, when foreign markets contract, producers are as much interested in keeping them open as in not swamping them. Production adjustments and increased selling enterprise must be twin supports. As many old outlets must be retained and as many new ones opened as possible. The need for reducing exports is no reason for losing interest in foreign markets. All farmers, even those with

the broadest home markets and the least competition, suffer when commodities intended for export back up into home-trade channels. This is the situation now, as I showed in some detail in my last annual report.

Therefore, the department is increasing its efforts to assist farmers in correctly appraising factors of competition and demand in foreign countries that affect the outlet for their products. The work is principally informational. The department advises United States cotton growers on developments affecting the foreign demand for American cotton. It reports regularly on the activity of foreign cotton mills, the economic position and buying power of various markets, the stocks of cotton and cotton goods on hand, the competition of foreign producers. In like manner, the department gathers information on wheat, feed grains, meat products, wool, tobacco, oilseeds, fruits, and other products from all parts of the world, and presents this information to farmers and others in a usable form. The profitableness of this trade depends enormously on timely and reliable information.

Trade Currents Constantly Shifting

Trade currents in the great staples have shifted greatly since the war. American exports of cotton to northwestern Europe have declined in actual quantities and in proportion to total United States exports. Since 1929 American shipments of wheat and hog products have declined also. On the other hand the post-war period has seen a great increase in agricultural export trade with the Orient. In the five years 1927–1931 the Orient took more than 13.7 per cent of the agricultural exports of the United States, compared with only about 3 per cent in the five years preceding the war. Shipments of cotton and tobacco to Japan and China have increased enormously. Wheat exports to those countries have also grown, reflecting a tendency in Japan and in parts of China to substitute wheat for rice in the diet. Important outlets for some farm products of the United States are being developed in the tropical regions of Latin America. Though these areas can not purchase any great proportion of the exportable surplus of the United States, trade with them has possibilities of great expansion. Like the trade with the older markets, it needs to be founded on accurate, comprehensive, and regular information on demand and competition. In recent years the facilities of the department for meeting this need have been much improve.

Service Aids Fruit Producers

Fruit has strikingly resisted the general downward trend in American agricultural exports. Though it has decreased somewhat in the last year or two, the volume of the export trade in fruit remains twice as great as it was before the war. This is a particularly noteworthy achievement considering the growth of world competition in the fruit trade and the tendency of many countries to restrict their fruit imports. Apples are the principal item in our fresh-fruit export trade. In exporting apples successfully, exporters need facilities for getting high-quality fruit to distant markets in good condition and sufficient information about market conditions.

This latter requirement the department helps to supply through its foreign agricultural service. The department's fruit specialist

regularly and frequently visits all the principal fruit-receiving ports of northwestern Europe and reports on the condition of fruit shipments from the United States. He also sends weekly cables during the marketing season, giving detailed and specific information on supplies of fruit on hand and due to arrive. Formerly receipts of American barrelled apples in the United Kingdom varied greatly and prices fluctuated in close sympathy with the receipts. A survey just prior to the depression showed the prices averaged around $8 a barrel when semimonthly receipts were 25,000 barrels; rose to $10 when receipts dropped to 5,000 barrels; but dropped to an average of around $4.50 when receipts amounted to 30,000 barrels. On learning these facts, shippers and growers began to regulate their shipments better. Individual shippers receive reports with suggestions and recommendations in regard to their shipments. The information is definite and detailed. Should a shipper wish to export Winesap apples of a certain size and grade, he gets a report on what that particular variety, size, and grade has recently brought on the European market.

Helping Tobacco Producers

How the department aids the American exporter can be shown by the work done on tobacco. This country exports about a third of the tobacco it produces; it exports more than 50 per cent of its production of some types of tobacco. The trade shifts constantly in response to changes in the consumption of different types and grades of tobacco in foreign countries. Some of the changes result from changes in fiscal policies. Others reflect changes in the habits of consumers. Many countries are increasing their domestic production of tobacco so as to be less dependent on imports. American tobacco growers and importers must know about these conditions. Accordingly, the foreign agricultural service furnishes current reports on the conditions of supply and demand in foreign markets, and on changes in tobacco consumption. As in the case of the fruit trade, the reports are highly specific. They give growers and shippers such facts, as, for example, that most European countries want tobacco with a low nicotine content; that more attention to the production of wrapper grades would probably pay since these grades are difficult to displace; and that certain types of tobacco face competition so strong that the demand will decline unless the quality improves.

Information intended to strengthen our agricultural export trade emphasizes quality considerations. Price is the principal factor determining export sales of the great staples such as cotton and wheat. Quality considerations are nevertheless of great importance even to these commodities; in the case of fruits, tobacco, meats and meat products, and other commodities, the quality factor is often primary. The foreign information service furnishes growers and exporters with specific details on how they may meet the various foreign-market requirements.

FEDERAL STANDARDS AND GRADES

Besides serving as a guide to improving the quality of farm products, as shown under the section on research, Federal standards for farm products and Federal supervision of grading services effect many savings for agriculture. They facilitate marketing to the benefit of producer, middleman, and consumer. Federal standards afford

a uniform national yardstick wherewith to measure variations in the quality of farm products as a basis for trading. These standards, by expressing gradations of quality in a common trade language, widen the distribution of farm products, promote confidence among buyers, reduce marketing costs, furnish a definite basis for market quotations and market-news services, and help farmers to get prices that reflect more fairly the quality of their products and the state of the markets.

In our wheat export trade, Federal standardization is the basis of delivery contracts. In domestic transactions it protects the grower. This is well illustrated by what happens when the wheat crop in any community, instead of being graded, sells at a flat price for average-run wheat. The buyer fixes his price to cover his hazards in handling damp, smutty, weather-damaged, or otherwise off-grade deliveries. The necessary discount depresses the price. Producers whose wheat is above average quality lose heavily. Marketing under Federal standards, and under the protein tests made by State and private protein-testing laboratories in the important grain markets, prevents such losses. Buyers will commonly pay premiums of from 2 to 10 cents a bushel for wheat of high grade, and premiums of 5 to 15 cents a bushel for wheat of exceptionally high protein content.

Because cotton-classifying facilities are not yet adequate at all country markets, growers of superior fiber often have to accept prices no higher than those paid to growers of poor fiber. When the superior cotton is graded and assembled in commercially important quantities at the central markets, however, it commands a premium.

Grading Promotes Export Trade

American rice enjoys a favorable position in European markets because it is standardized and reliably graded. In 1929 and the first half of 1930, while Asiatic rice was declining in price in London, United States rice advanced in price. This was largely because buyers had confidence in United States rice standards and inspection services. Fruit exports from this country benefit similarly from the existence of dependable standardization and grading services. Wherever growers market their products ungraded, buyers tend to quote and pay average prices. Occasionally this average price may exceed the true market value of the lower-grade deliveries, but it will almost invariably be less than the market value of the top-quality deliveries. The system discourages high quality production.

Recent Improvements in Grading

In response to a growing demand, the department has extended its commodity-standardization work during the last few years. It has formulated standards for about 30 additional crops including tomatoes, spinach, cherries, apples, and corn for canning. It has revised many of the earlier standards in accordance with modern trade practices and has conducted investigations of protein tests for wheat and oil tests for flaxseed and soybeans. It has developed and applied various mechanical and chemical tests for determining the quality of various products. An improved cotton-fiber sorting machine measures cotton-fiber lengths with extreme accuracy. Another machine tests the strength of the fibers. One new electrical device measures the moisture content of grain, doing in 30 seconds what used to take

40 minutes. Technical tests determine the sugar content of grapes and the maturity of citrus fruits. A gravity method shows the maturity of cantaloupes. In grading canned fruits and vegetables a pressure gauge indicates the vacuum condition of the can. Hydrometers measure the density of sirups, salinometers test brine solutions, and penetrometers show the consistency of such products as canned pumpkin. Mechanical devices register the ripeness of canned corn. A pressure tester reveals the maturity of plums, apples, and pears. A colorimeter measures color in hay, cotton, and honey, in which color is an important quality factor. Eventually, most of the dependence on personal judgment or skill in farm-commodity grading may be eliminated, and grading will become increasingly uniform under all conditions.

Increased Use of Standards

The use of Federal standards has increased materially. In the fiscal year 1929, the total inspections, on a permissive basis, of fruits and vegetables at shipping points and receiving markets amounted to 266,831 car lots. In 1932 the total inspections amounted to 335,649 car lots. In 1929, 75 cotton classifiers held licenses issued by the department. In 1932 the number had increased to 262. Soybean inspection increased from 733 car lots in 1929 to 5,564 car lots in 1932. Federal grades and grading services became available for certain canned fruits and vegetables in 1932. It was applied to more than 2,000,000 dozen cans.

Beef Grading

The demand for the department's beef grading and stamping service increased about 78 per cent over that of the previous year. The service was applied to 183,784,000 pounds of beef. Packers and slaughterers paid for it, and this fact reflected the growing insistence of consumers for graded beef. Under this arrangement the department certifies the quality of beef according to Federal standards. Various tangible benefits result. Consumers more willingly pay premiums for high-quality beef when they know dependably what they are buying. Growers profit from the stimulus thus given to the quality market. They have also an additional incentive to produce high-quality beef. Beef grading and stamping service is now available at New York, Boston, Philadelphia, Baltimore, Washington, Buffalo, Erie, Detroit, Chicago, Sioux City, Omaha, Kansas City, Topeka, Wichita, and St. Louis.

Tobacco Grading

Tobacco grading increased materially during the year. Inspectors graded 61,250,000 pounds of tobacco on the open market and 55,000,000 pounds for cooperative associations. They did grading at 75 auction warehouses and 57 cooperative receiving stations. The department reported the stocks of tobacco in the hands of dealers and manufacturers at quarterly intervals. It started market reports on tobacco sales at several points in the southeastern territory. Previously tobacco men had comparatively little detailed information about their industry.

CROP ESTIMATES

Farmers, aealers, railroads, bankers, economists, and legislators showed unusual interest during the year in the department's crop and livestock reports. Buyers and sellers closely watched the monthly forecasts and estimates and welcomed efforts by the department to increase the accuracy and scope of its crop and livestock information services. The cotton reports of 1931, under extremely unusual crop-growing conditions, proved surprisingly accurate. The first forecast of the season was much at variance with private trade estimates. As the season advanced, however, the official forecasts were confirmed. This result attested the value of new forecasting methods and principles developed within the last few years. These methods involve complex relationship studies of the weather, acreage, prices, and other factors. They underwent a severe test in the unusual and widely divergent conditions in the 1930 and 1931 cotton seasons. The recorded data for these two seasons, by enlarging the scope of conditions observed, will help future crop forecasting greatly.

In the last year the department compared its previous crop estimates with the census enumeration of the crops of 1929. In practically all the major crops it found a close agreement between its own estimates and the census data. The 1929 wheat-acreage estimate, for example, was 2 per cent below the census. The wheat-production estimate was only slightly below the census. The corn-acreage estimate was about 2 per cent above the census.

The department's crop-reporting service devoted more attention to the fruit crops, and issued regular and special reports. It gathered new statistics on the production and utilization of milk and furnished other inportant information to the dairy industry. It adapted these reports as nearly as possible to dairymen's need of current information on trends in milk production and on adjustments taking place in the dairy industry. Reports on poultry and eggs, issued at regular intervals, met the practical needs of poultrymen. Livestock reporting made progress. An important innovation was the issuance of tentative estimates instead of percentages to indicate the size of the pig crop and the number of sows expected to farrow.

SERVICES IN HOME ECONOMICS

The department helped families in both town and country to safeguard their health, making scientific knowledge about food available in a usable form. At the request of the American Red Cross and agencies dealing with drought and unemployment relief, it maintained a special service on low-cost diets. Restricted or unbalanced diets often cause pellagra and rickets and leave their trace in many other less conspicuous abnormal conditions.

Emergency Food Program

The diet service showed how the food dollar may best be used to provide the essentials of nutrition.

Research in dietary requirements for proteins, starches, sugars, fats, vitamins, and minerals shows what to eat and how to get the best possible balance of diet under the circumstances confronting the people for whom this service is primarily intended. Such knowledge the department made available last year to millions who used it to

conserve health and strength against the inroads of declining income. It presented the facts concretely—in definite quantities of milk and other dairy products, cereals, meat, eggs, fats, and sweets. Then it divided the food dollar and assigned a proportion to each of the main food groups. Thus it was a simple matter for families or relief agencies to check their expenditures against the standard for a balanced diet. Anyone seeing for the first time a menu thus prepared might think of it as just a menu. It was really a channel through which flowed vitally important scientific knowledge.

Relief agencies, agricultural workers, and individuals used more than 1,000,000 copies of the department's bulletins and charts on low-cost food. Many welfare organizations reprinted the material. Producers as well as consumers benefited, because press releases called attention to the seasonal price fluctuations of eggs, fresh fruits, and vegetables, and helped to stimulate demand during peak production.

Permanent Program

In thus disseminating food knowledge, the department desired not merely to help families tide over the depression. It sought to permanently increase health and well-being. The end of production is consumption. It is not intelligent to emphasize efficiency in production while neglecting efficiency in consumption. There is as much room for improvement in the one as in the other. Food articles lose much of their value when poorly cooked or improperly combined. The loss is not merely a money loss. It is a loss in human efficiency. The nation pays, in sickness and depleted physical energy, the enormous cost of its ignorance about food. This cost is not confined to people of small incomes. Malnutrition exists also among the well-to-do. The remedy is to make people better informed on what science has discovered about food. Malnutrition and the ills that go with it are wholly preventable among people of moderate incomes, and largely preventable even among the poor.

During the year investigators gathered new material on the chemical composition and vitamin content of different food materials, and furnished data to dietitians, food manufacturers, and farmers. The information thus distributed tends to bring production technic into harmony with consumption requirements.

Home Canning

As an aid to the well-balanced diet, farm women and city women in communities with home-garden projects canned and preserved large quantities of fruits and vegetables in ways recommended by the department. Some States organized household preservation of foods as part of a live-at-home program and in many localities farm women clubbed together to buy the necessary equipment. Three States reported a total of nearly 15,000,000 containers of fruits and vegetables canned as part of "save-the-surplus" projects. Sometimes, however, in their zeal to save large quantities of food, relief workers and individuals asked the department to recommend the canning of corn, string beans, and the other nonacid vegetables, by the easy method used with tomatoes and acid fruits. Studies on the bacteria in home-canned foods prove this unsafe. The department therefore issued repeated warnings to home canners urging the processing of all

vegetables except tomatoes in the steam-pressure canner. By this timely distribution of home-canning directions backed up by scientific research, the department helped women to save large quantities of perishable foods.

Textiles

Quite as timely was the information on the use of textiles sent in response to the demand of both farm and city women who sought particulars of the department's investigations of new uses for cotton and wool in clothing, new hygienic designs for children's clothing, and the relation between clothing and health. Unquestionably, for example, proper dressing helps to control the common cold in children. Eight manufacturing companies now make patterns for children's clothing from 29 designs developed by the department, and textile mills manufactured new types of cotton fabrics suggested as more suitable for children's clothing than those formerly on the market.

Last year the department prepared several exhibits on children's clothing. They accommodated only half the requests received from universities, nursery schools, public-health clinics, parent-education classes, and merchandizing departments of retail stores. In several States, extension groups and nursing associations made duplicate sets of the exhibits. Manufacturers showed increasing interest in the work.

Quality studies on different grades of cotton and wool woven into such staple household fabrics as sheets and blankets yielded results equally valuable to textile users, manufacturers, and growers. These studies completely cover the cycle of textile production and consumption and show how grade of fiber influences the durability of the finished fabric when it is put to actual use.

EXTENSION AND INFORMATION

Through the Extension Service the department communicated to farmers and others the practical results of its investigations in agricultural technic, agricultural economics, and home economics. This is a many-sided activity involving cooperation with the State agricultural colleges, State extension services, and State experiment stations. It is continuous. Knowledge gained in research influences farmers everywhere through farm demonstrations, lectures, public meetings, motion pictures and exhibits, agricultural fairs, club projects organized under local leadership, farmers' short courses at the agricultural colleges, and many other channels. Extension work covers every phase of farming from soil preparation to harvesting and marketing and various aspects of home making. It emphasizes old truths as well as new, so that farm practice may be brought as closely as possible into harmony with farm science. During the last fiscal year, the extension service gave special attention to crop-adjustment problems, marketing, and ways of supplementing and conserving farm incomes. It aided in extending production loans from congressional appropriations made in 1931; I have already reported how this credit was made available.

Guided by information furnished through the Extension Service, farmers made important crop readjustments. They reduced their acreages of some crops and increased the acreages of others. Surveys indicated that in the Cotton Belt 21 per cent of the farmers and in

the wheat belt 22 per cent used the department's outlook information. They combined technical with economic information in such a manner as in many cases to increase their profits and in other cases to reduce losses. Extension workers stressed the importance of improved seed, correct fertilization, up-to-date methods of cultivation, disease and insect control, and the feeding, management, housing, and sanitation of livestock. As bearing more directly upon marketing, they urged proper grading, handling, and packaging of products, and pointed out opportunities for timing and distributing shipments efficiently.

Some Extension Achievements

A few specific examples will illustrate the general character of extension work.

Tomato growers in Cumberland County, N. J., on the advice of extension agents, planted their tomatoes earlier. The change in the time of planting gave an increase in yields estimated to be worth $20 to $24 an acre. Poultry raisers in Sullivan County, Ind., reduced the mortality of baby chicks 16 per cent by following Extension Service recommendations. On this one item alone they saved about $3,000 during a season. Growers of early potatoes along the Atlantic seaboard ordered and timed their shipments throughout the season to maintain a stable price level. They received each day, by wire and telephone, information about shipments, market receipts, and prices. In New Hampshire, a survey showed that local markets were not using locally grown potatoes. The Extension Service helped growers in a marketing campaign which sold 100,000 bushels of New Hampshire potatoes for local consumption.

One case goes back to a survey of dairying possibilities made 10 years ago in Boyd County, Pa. The survey indicated the existence of a local demand for better-quality milk. Accordingly, extension workers assisted the farmers in obtaining good cows, modern dairy equipment, and purebred bulls, and in organizing a dairy-herd improvement association. Last year the income from dairying in this county was $250,000, compared with $50,000 a decade earlier.

The Extension Service helped in the organization of 1,710 new cooperative-marketing associations during the year. It gave instruction to members and nonmembers in standardizing, grading, and packing farm commodities. In Bucks County, Pa., extension workers recommended a farmers' egg auction; one was organized and marketed more than $150,000 worth of eggs during the fiscal year. Demonstrations in killing, packing, and grading turkeys aided the western turkey industry. In four years a Nevada cooperative organization sold turkeys valued at $544,728. It increased the percentage of its turkeys that graded No. 1 from 50 per cent in 1928 to 90 per cent in 1931.

Live-at-Home Program

Extension workers, especially in the South, advocated a live-at-home program, which helped farmers and their families to conserve cash income. The live-at-home idea spread over the country rapidly. It took root in every State and influenced many small towns and suburban areas. Its essentials are the growing on the farm of feed and food required for home consumption; the more careful buying of farm and household supplies; the better care of clothing, furniture,

and household equipment; and the development of inexpensive forms of healthful recreation. Farm gardens in Texas increased 45 per cent in 1931 over 1930 and the canning of fruits and vegetables in that State trebled. Texas farmers produced 75 per cent more meat for home consumption. In Charleston County, S. C., two-thirds of the farm women cooperated in a program calling for an all-year-round garden, cows to supply the family milk, farm poultry flocks, a surplus of poultry and dairy products for local marketing, and improvement of home grounds.

More than 38,000 local groups or clubs of farm women, and more than 60,000 boys' and girls' 4-H clubs helped in these efforts to augment and conserve farm incomes. The women's groups had an enrollment exceeding 760,000 and the 4-H clubs an enrollment exceeding 900,000. Extension agents reported that during the year farmers and members of their families gave more than 20,000,000 demonstrations of improved ways of carrying on farm and household operations.

Extension Forestry

Three leading projects in State extension forestry programs are: (1) The management of farm woods for increased returns; (2) the establishment of young forests through the planting of idle farm lands to trees; (3) the teaching of forestry to rural school children through club activities. In the last fiscal year the Extension Service assisted 9,534 farmers in woodland management. It cooperated in 7,057 farm-forest plantings, and in the establishment of 4,676 windbreaks. It took part in 7,877 junior forestry projects undertaken by 4-H club members. It helped farmers also with advice in estimating timber, marketing timber, protecting wood lots from fire, and preserving timber. The department cooperated with 32 States and 2 Territories in extension activities to assist farm-woodland owners with their timber.

Publications, Press, and Radio

In addition to its extension activities, the department furthered its educational program by continuing to issue printed publications, to broadcast radio programs, and to issue releases to farm journals, newspapers, trade magazines, and other periodicals.

New policies put into effect during the latter part of the fiscal year 1932 are reducing by 30 per cent the cost of disseminating agricultural information. At the same time the department is continuing its efforts to carry forward a function made mandatory in the law whereby the institution was created, namely, the diffusion of useful information on subjects connected with agriculture in the most general and comprehensive sense. The most significant change in information policy restricts the free distribution of bulletins. Technical publications are now supplied free only to libraries and to some 200 scientists who cooperate with the department. The free distribution of popular bulletins was reduced 50 per cent. Various periodicals were cut down in size. The reprinting of technical publications was discontinued. Numerous other economies were effected.

These economies are mainly temporary expedients necessary in the existing fiscal emergency, but some of them are not permanently desirable. The Extension Service is handicapped in not having a

supply of publications to help carry forward its teaching work. Cooperating State institutions can not obtain Federal publications which they need. Valuable research results, obtained at considerable cost, can not be published promptly. Farmers and others direct as many as 1,000,000 queries a month to the Washington offices of the department; popular bulletins, which cost about 1¼ cents each, are usually the cheapest and most efficient means of answering this correspondence. When curtailed publication reduces the supply of these bulletins, or prevents the publication of new ones on matters concerning which important information is available, the queries have to be answered by letter. The average cost of such letters is about 26 cents.

Consequently, the department will continue the publication of technical bulletins recording the results of basic research and of popular bulletins for farmers and home makers. As before, the popular bulletins will deal with the control of animal and plant pests, the development of improved plants and livestock, the improvement of quality in farm products by up-to-date cultural practices, the adjustment of farm production to demand, the improvement of living standards through the more efficient utilization of foods and fibers, and other subjects of practical importance. Press releases and radio broadcasts will supplement the publications. Newspapers, farm magazines, and other branches of the press give space and the radio broadcasting companies give radio time to the department. Thus the gap between discovery and publication is narrowed, and useful information reaches the public promptly in a usable form. The necessity for these varied informational activities appeared last year in an increased demand for the department's publications, press releases, and radio broadcasts. Specially noteworthy was a larger call for economic information. There was an increased demand also for technical information on farm costs of production and on stretching the food dollar, on home gardening, home canning, and so forth. People everywhere showed awareness of the fact that hard times put a premium on scientific knowledge in all sorts of agricultural, industrial, and domestic activities.

During the year the department suggested a plan which, if adopted for the Government as a whole, will facilitate the sale of Government publications and may place this desirable type of educational effort practically on a self-paying basis.

SEED VERIFICATION

For the protection of alfalfa growers, the department, through its seed-verification service, certified the regional origin of 85 per cent of the alfalfa seed produced in the United States last year. This is necessary because alfalfa seed from one locality may not be adapted to another. Sixty-five seed dealers in 22 States cooperated with the department in maintaining this service. Formerly growers in Montana, North Dakota, and South Dakota purchased and planted quantities of unadapted southern seed. They lost not merely the cost of the seed, but temporarily the use of the land on which it was planted. Through seed verification, the department last year prevented alfalfa seed from the extreme Southwest from entering the Northwestern States for planting. It enabled growers to be sure that alfalfa seed they purchased would grow.

MEAT INSPECTION

As in previous years, Federal meat inspection protected the health of consumers and made possible a large export trade in meats and animal products, besides furnishing veterinary and economic data valuable to the livestock and meat industries. Altogether more than 77,000,000 food animals were slaughtered during the year under the sanitary conditions and rigid veterinary supervision provided by the Federal meat-inspection service. This number of animals represents nearly a 4 per cent increase over the corresponding number a year ago.

In addition to its other public benefits, Federal meat inspection has aided materially in raising the plane of animal health, which already is high compared with that of most other countries. It has done this in two principal ways—by disclosing the localities where various diseases and parasites exist and by providing well-trained inspectors for actual disease control and eradication work. Such work is most active during warm weather, whereas Federal meat inspection is at its peak during the cold months. This condition makes possible and desirable the seasonal shifting of trained inspectors to different lines of work with resulting economy and efficiency in both meat-inspection and disease-control activities.

FIGHTING DISEASES AND PESTS

Foot-and-Mouth Disease

In April, 1932, the United States suffered its tenth invasion of foot-and-mouth disease, a foreign livestock scourge. It was stamped out in 10 days, largely as a result of effective cooperation by all concerned. None of the previous outbreaks was so quickly eradicated.

The owner of a garbage-feeding establishment in Orange County, Calif., on April 22 reported the death of four hogs and lameness in many others among the 4,000 hogs that he had on feed. Veterinarians examined the animals and indicated the possibility of foot-and-mouth disease. They notified Federal and State officials, who imposed a rigid quarantine. Tests diagnosed the disease positively on April 28. The department assigned a force of veterinarians to cooperate with State and county officials. All affected or exposed animals were slaughtered and buried. The infection spread to a number of premises in Los Angeles County and to one in San Bernardino County. It appeared only on ranches where garbage was fed, and affected swine, which are very susceptible. Livestock were infected on 8 ranches and exposed to the disease on 19. After using test animals to determine that no infection remained, and seeing that the premises were cleaned and disinfected, the department lifted the quarantine on August 24.

In this outbreak the virus was of low virulence. Nevertheless, it might have caused an extensive and costly spread of the disease. Had the first report been delayed only 48 hours, hogs from the infected ranch would have been shipped to market and would have infected other animals and premises. The densely stocked dairy district of Los Angeles was only a few miles distant. The United States remains the only major livestock country completely free of this deadly disease.

Tuberculosis—Cattle-Tick Fever

Fifteen years ago, when the Federal Government, in cooperation with the States, began the systematic eradication of bovine tuberculosis, the degree of infection among cattle was more than 4 per cent. On June 1, 1932, the degree of infection was only 1.4 per cent. Out of more than 13,000,000 cattle tested during the last fiscal year, only 254,785 proved tuberculous. Area testing, a method by which all cattle in a given area are tested within a short time, continued to be effective and economical. At the end of the fiscal year, 1,443 counties (and part of 1 county in Tennessee and 60 towns in Vermont) had completed one or more tests of all the cattle within their borders. These counties and towns were officially designated as modified accredited areas. Eight entire States—North Carolina, Maine, Michigan, Indiana, Wisconsin, Ohio, Idaho, and North Dakota—have been pronounced practically free of bovine tuberculosis. The four States last mentioned achieved this distinction during the last fiscal year. In most States the demand for tuberculin testing exceeds the available facilities.

In the task of eradicating the cattle tick, the carrier of tick fever, the department cooperates with State and county officials and with cattle owners in the Southern States. Last year it helped actively in vigorous campaigns in Arkansas, Florida, and Texas. Federal and State agents supervised the inspection or dipping of more than 20,700,000 cattle and 2,057,000 horses and mules. This work permitted the release from Federal quarantine of 7 counties in Arkansas, 6 counties and parts of 2 others in Florida, and 4 counties and parts of 3 others in Texas. The aggregate area released was 16,607 square miles. At the end of the year, the Federal quarantine was limited to parts of four States—Arkansas, Louisiana, Florida, and Texas.

Stockyard Inspections

Employees of the department in the last fiscal year inspected nearly 17,000,000 cattle and 30,000,000 sheep at market centers to prevent the spread of communicable livestock diseases. They also supervised the dipping of large numbers of these animals for the same purpose. They inspected more than 35,000,000 swine, and supervised the immunization of large numbers intended for further feeding. As an additional means of preventing the spread of livestock diseases, the department supervised the disinfection of 17,595 stock cars. It caused improved facilities for feeding, watering, and resting livestock to be provided at numerous railroad unloading stations. This was effected in the administration of the 28-hour law which limits the time during which livestock may be confined in railroad cars.

Barberry and Blister-Rust Eradication

During the 13 years that barberry eradication has been in progress the average annual loss to wheat from black stem rust in the cooperating States decreased from 57,000,000 bushels for the 5-year period 1916–1920 to less than 10,000,000 bushels for the 5-year period 1926–1930. In 1931 the damage from this disease continued low, amounting in the case of wheat to about 4 889,000 bushels. In some of the

north-central and western grain-growing States the remaining barberries are few and scattered. In other States of the eradication area, such as Iowa, Wisconsin, Illinois, Ohio, and Michigan, the bushes are numerous. The department endeavors to reduce the expense of finding and destroying bushes and to interest property owners and children in the work. Thousands of farmers have had little, if any, difficulty with stem rust since the barberry bushes near their farms were eradicated.

Climatic conditions in 1931 promoted an extensive spread of white-pine blister rust in the Eastern States. From the generally infested northeastern region the disease spread into the bordering States of Maryland, Virginia, West Virginia, and Ohio. It appeared in several new places in the Lake States and in one place in Iowa. Forty-five additional centers of pine infection appeared in the commercial areas of western white pine in northern Idaho. The disease was found on currant and gooseberry bushes (Ribes) in southwestern Oregon within the range of valuable susceptible forests of sugar pine. It seems certain that the rust will reach the main sugar-pine belt of California.

The department in cooperation with State agencies, has developed methods that promise success in protecting the white-pine forests of the West from blister rust provided these methods are applied before the trees become generally infected. Local control progressed in northern Idaho last year. Much more extensive work, however, is necessary. Only widespread control operations can avert a catastrophe in the western white-pine regions. White-pine blister rust spreads to pine trees only after an intermediate development on currant and gooseberry bushes. It has been demonstrated in the East that these bushes can be suppressed and the pines protected on any area where the pine values justify the expense. In New England and New York, white pine areas aggregating more than 8,000,000 acres have been protected at an average cost of 21 cents an acre. The control problem is different in the West. It can be solved, nevertheless, with the cooperation of Federal and State agencies and pineland owners. Failure to protect our white-pine resources against blister rust would mean an eventual loss of probably $400,000,000.

Phony Peach Disease

Cooperative campaigns for the eradication of the phony peach disease had important results in Georgia and Alabama, where the disease is most severe, and in numerous other States. In lightly infected territory the number of infections was reduced from 1 tree in 5,000 to 1 tree in 16,666. In moderately infected territory it was reduced from 1 tree in every 288 to 1 tree in every 430. In heavily infected territory it was reduced from 1 tree in every 45 to 1 tree in every 90. Growers removed whole orchards in the heavily infected territory of Georgia. In addition to Alabama and Georgia infections have been found in Arkansas, Illinois, Louisiana, Mississippi, North Carolina, South Carolina, and Texas, and more recently in Missouri and Oklahoma.

Date Scale—Gipsy Moth

Two important insect-eradication projects approached completion during the year. One aimed at the total extermination of the Parlatoria date scale in the Southwestern States. This insect, where it

becomes firmly established, can not be economically kept under control by individual growers. Hence, its complete elimination is necessary to the maintenance of the date industry, which produces now about 3,000,000 pounds of dates annually. The Parlatoria scale was introduced accidentally when date culture was started in the Coachella and Imperial Valleys of California and in the Salt River Valley and Yuma district in Arizona. The department, in cooperation with the States concerned, began an extermination campaign 12 years ago. The campaign apparently eliminated the Parlatoria scale in Arizona. Only 16 infested date palms were found in California. Some fan palms and Canary Island palms were found infested. But a comparison of these figures with those of two years ago, when 621 infested palms were found, suggests that complete success is near.

The other pest-eradication project that came near complete success during the year was a campaign against the gipsy moth in New Jersey. The campaign, which the department began 10 years ago in cooperation with the State, covered an area of 400 square miles. Not since May, 1929, have any gipsy moths in any stage of their life cycle been found in the formerly infested area. Entomologists believe the eradication is complete. The department is conducting another gipsy-moth-eradication campaign on Long Island in cooperation with the State of New York. Except for this infestation, the insect is confined to the New England States. It is being held east of a barrier zone only about 30 miles wide, extending from the Canadian border to Long Island Sound. The insect, despite expensive control operations conducted by public and private agencies, causes serious defoliation each year. By preventing it from spreading west of the barrier zone and by cooperating in the extermination of the outside outbreaks in New Jersey and Long Island, the department protects the forests of the States west and south of New England.

Pink Bollworm—Port Quarantines

The pink bollworm of cotton appeared in southern Florida in the spring of 1932. Fortunately the infestation was 400 miles distant from commercial plantings. The department expects to eradicate the insect before it spreads to any of the cotton-growing areas of the Southern States. The known infested area consists of a small patch of cultivated cotton near Miami, and a large tract of wild cotton in a section of Florida extending from south of Miami to Key West. This insect is one of the most serious cotton pests. It occurs in the West Indies, in Mexico, and in the principal cotton-growing areas of the Eastern Hemisphere. It has appeared in the United States only in a limited area in the Southwest, where eradication efforts are going forward. At present the insect does not occur anywhere in the main Cotton Belt.

Port and border quarantine enforcement continues to protect the United States against foreign insects and plant diseases. The department intercepted last year nearly 17,000 pests on imported plants and plant products. These included more than 12,000 insects, many of them highly destructive, such as the fruit flies. Port inspectors discovered fruit flies in fruits and vegetables in 140 different lots at numerous ports of entry.

Mechanical Aids to Control

Sometimes plants and plant products that are infested with pests can be safely moved in commerce after they have been sterilized or disinfected. The department has developed many such processes, and strives constantly to cheapen and simplify them. As this is accomplished, it becomes possible to lighten quarantine restrictions without lessening their effectiveness. Recently, in cooperation with one of the larger cotton-marketing concerns, the department developed a machine for destroying pink bollworms in cotton lint. It passes lint through rollers at a pressure of about 2,000 pounds per square inch. This process destroys all pink bollworms in the seed and saves the cost of fumigation, which is about $1.25 a bale. Other investigations developed a method of sterilizing cottonseed, so that growers producing particularly good strains within the area regulated for the control of the pink bollworm can market their seed in uninfested regions without risk of disseminating the insect. In one area growers last spring treated 35 tons of seed by this method. The seed brought $60 a ton for planting. Had it been sold for the production of oil and meal, it would have brought only from $10 to $12 a ton.

The department also developed a method of sterilizing citrus fruit in areas infested by the Mexican fruit worm. This permitted the shipment of the fruit to uninfested areas. The method was applied to 214 carloads. The fruit brought from $1 to $2 more a box than it would have brought had it been sold when gathered. This was a result partly of a favorable change in the market and partly of the excellent condition in which the fruit was left by the sterilization process. A gain of from $50,000 to $75,000 on the whole 214 carloads was estimated. The department also devised a mechanical method of separating Japanese beetles from string beans. This method allows beans to be shipped from the regulated areas, without risk of disseminating the beetle, costs less than 1 cent a bushel, and broadens the market for beans. It can be applied to other products.

Rodents—Duck Diseases

Improved methods in predatory-animal and rodent control brought striking results in various parts of the country. The department, in cooperation with the Massachusetts State Agricultural College, established a plant for preparing a scientific ready-mixed rat bait. This plant, in the last fiscal year, turned out more than 150,000 cans of bait, and sold them at cost to cooperators in a rat-control program. Farmers in parts of Florida and other Southern States conducted successful campaigns for the control of cotton rats with assistance from the department. In the southern part of Dade County, Fla., an effective cotton-rat control campaign cost only $600. In this area cotton rats had previously damaged crops to the extent of $150,000 annually. The department furnished special baits for field mice to cooperating farmers in New England. As a result, the number of trees damaged dropped to 0.1 per cent. Rat-control campaigns in several counties of eastern Texas checked the spread by rats of an outbreak of typhus fever.

Department biologists discovered in 1931 that a disease of ducks which is prevalent in many western concentration areas of the wild

fowl is of bacterial origin. It had previously been considered to be of chemical origin. This discovery aided the States in conservation measures in areas where losses could be reduced by controlling water levels. Diking operations recently completed by the department on the Bear River Migratory Bird Refuge, at Great Salt Lake, Utah, are expected to prevent the duck disease on large areas of this famous ducking ground.

Insect-Pest Surveys

Insect-pest surveys, which the department makes annually to give advance knowledge of probable pest conditions and to indicate control requirements, proved exceptionally valuable this year. The Hessian fly, for example, was abundant. This pest, the worst enemy of the winter-wheat crop, can be largely controlled by delaying seeding. Accordingly, the department surveyed the situation well in advance of planting time and cooperated with State agencies in issuing warnings to farmers and in advising them to delay their seeding. Surveys of sugar-beet leaf-hopper conditions had a similar practical application. Sugar-beet growers in certain areas determine their plantings largely on the basis of information furnished through the leaf-hopper surveys. In some years the surveys indicate the likelihood of heavy migration of leaf hoppers into planting areas. In such seasons, farmers reduce their plantings. This year the department predicted that the infestation would be light in the beet-growing areas around Twin Falls, Idaho, and Grand Junction, Colo. That proved to be the case.

In the western area of its distribution (New York, Ohio, Indiana, and Michigan) the European corn borer entered hibernation in the fall of 1931 in the largest numbers yet recorded. Drought had reduced the pest in the previous season. The winter of 1930–31 favored its multiplication, as also did the crop season of 1931. Conditions favored the hibernating larvæ in the winter of 1931–32 and the survival was practically 100 per cent. Conditions continued to favor the insect during the spring of 1932. In June the outlook for corn-borer damage seemed about as bad as it could be. In July and August, however, excessive heat and drought burned up eggs and young larvæ on the corn leaves and prevented a notable increase of the pest.

Because the winter of 1931–32 was exceptionally mild, the boll weevil remained active and in some cases even continued breeding. As a result the carry-over of cotton weevils into 1932 was the greatest ever recorded. Over a long period of years, the average survival through the winter is estimated at 1 per cent. Records covering four States indicated the survival from last winter at from 4 to 18 per cent. Conditions did not tend to check the survival in the spring and early summer of 1932, and the insect caused exceptional damage to the first crop of cotton during July. In August, rainfall was scarce and temperatures high over much of the Cotton Belt. These conditions killed larvae wholesale in the cotton squares or buds. Hence over most of the area only the early crop suffered severely.

The Mexican bean beetle was about three times as abundant this year as it was last year. There was heavy infestation and an increasing spread of the insect well into the northern New England States. The codling moth was abundant throughout the United States. It was controlled to some extent in the Pacific Northwest by cool

weather in late spring and early summer. Heavy outbreaks of cutworms occurred in many sections. The corn ear worm was abundant practically throughout the corn areas.

The Grasshopper Menace

After three years favorable to several local species of grasshoppers, these insects again menaced crops in 1932. The department's surveys showed that they were particularly prevalent in South Dakota and North Dakota and in parts of Iowa, Nebraska, Minnesota, Wyoming, and Colorado. Grasshoppers caused widespread devastation in these States in 1931 and deposited eggs on an unprecedented scale. Egg survival in the spring of 1932 was nearly 100 per cent. The President recommended a supplemental estimate for control work, in cooperation between the department and the States affected, but the estimate did not receive congressional approval. No State funds were made available in South Dakota, where the outlook was worst. State funds assisted in reducing the damage in Minnesota, Iowa, Nebraska, and North Dakota.

As the season advanced, weather conditions moderated the grasshopper infestation. In a cool and backward spring the grasshoppers hatched from two to four weeks later than usual. Furthermore, frequent driving rains in South Dakota, Nebraska, and Iowa destroyed many of the insects in the period of most abundant hatching. The rains also helped to delay hatching well into or through June and, in addition, produced a rank growth of vegetation along roadsides and in grassland areas which furnished food to the young hoppers and held them from cultivated land long enough to permit the small grains to mature.

These favorable conditions did not extend into North Dakota and Minnesota. In those States, on the contrary, the weather favored the hatching and development of grasshoppers. The use of poison bait restricted the damage materially in North Dakota and Minnesota. Considerable loss resulted, nevertheless, and enough grasshoppers survived to provide for heavy egg laying. Hence 1933 may be another grasshopper year, at least in many localities. It is unlikely that weather conditions will again be as unfavorable to the development of the insect over large areas as they were this year, because the region affected is normally semiarid.

REGULATORY WORK

The department administers more than 50 regulatory acts. They are designed to eliminate or prevent economic abuses, social hazards, and a waste of resources. Many of the operations under these acts are, in character, services to the public and not merely law-enforcement activities. Thus meat inspection, provided for by the meat-inspection act, has been discussed under service activities.

Under the grain futures act, the department as usual recorded trading in grain futures on the contract markets. Such trading during the past fiscal year amounted to only 13,566,157,000 bushels, as compared with 17,034,201,000 bushels in the previous fiscal year. This was the smallest volume of trading in futures in any similar 12-month period since the fiscal year ended June 30, 1924. For the 11-year period since 1921, the yearly average was 20,440,422,000 bushels.

The decrease last year was mainly in corn futures. At Chicago, trading in corn futures dropped to 2,500,000,000 bushels from 5,000,000,000 bushels the previous year. Trading in wheat futures in all the contract markets totaled 10,147,490,000 bushels, or 84,000,000 bushels more than in the previous year. On the Chicago market, the volume of trading done in wheat futures exceeded that of the previous year by 205,000,000 bushels. The department designated the Hutchinson Board of Trade Association as a contract market for wheat and trading began there May 16, 1932.

Hearing Under Grain Futures Act

On complaint of the Farmers National Grain Corporation against the Board of Trade of the City of Chicago and the Board of Trade Clearing Corporation, the commission established by the grain futures act, consisting of the Secretary of Agriculture, the Secretary of Commerce, and the Attorney General, held a hearing in June, 1932. The complaint declared that the Farmers National Grain Corporation is a legally formed and conducted cooperative marketing association and that as such it had been unlawfully excluded by the Chicago Board of Trade from the board's clearing corporation. This action, it was declared, violated section 5 (*e*) of the grain futures act. The Farmers National Grain Corporation contended that this exclusion compelled it to pay other members of the board of trade a commission for clearing trades. The commission, on July 23, 1932, decided the complaint in favor of the Farmers National Grain Corporation, declaring that the Farmers National Grain Corporation is a cooperative association entitled under the grain futures act to all the privileges of a contract market, including the right to clear its own trades in its own name.

The commission has no power under the grain futures act to compel the admission of cooperative associations to contract markets by injunctive process. It might be better from the standpoint of the cooperatives if the law were amended to afford cooperatives the right of relief through injunctive process. As the law stands at present, however, the commission has only the power to revoke or to suspend a market's official designation as a contract market. Under the grain futures act no market can trade in futures unless it is designated a contract market. Accordingly, and subject to the appeal provisions of the law, the commission suspended the Chicago Board of Trade as a contract market for a period of 60 days. It reserved the right to entertain an application for mitigation of the penalty upon a showing that the board of trade had receded from its position in regard to the Farmers National Grain Corporation. The Chicago Board of Trade appealed immediately from the decision to the United States Circuit Court of Appeals for the Seventh Circuit. This procedure stayed the commission's order. At this writing, the case is still pending. The order of suspension, of course, would affect only dealings in futures on the Chicago Board of Trade and would not affect that market's dealings in actual cash grain. The futures markets of Minneapolis, Duluth, Kansas City, St. Louis, and Milwaukee would also be available for hedging cash grain.

The United States district court decided the case of Bartlett Frazier Co. *v.* Hyde, et al, in favor of the defendants. In this suit, the complainant company sought an injunction to restrain the Secretary of Agriculture from examining the books and records of members of

the board of trade, and from requiring them to furnish reports concerning their trades. The court declared the entire grain futures act to be a valid regulatory measure. It found that the departmental regulations and inspections of records made by the direction of the Secretary are reasonable exercises of the power conferred. It declared also that the Secretary had not transcended the limits of what is essential to the intelligent performance of the duties imposed upon him by law. This case, too, is pending on appeal to the United States Circuit Court of Appeals for the Seventh Circuit.

Warehouse Act Benefits Farmers

Important financial benefits accrued to farmers organizations through the licensing of storage warehouses under the Federal warehouse act. This law now covers warehouses handling about 50 per cent of the cotton crop and nearly 400,000,000 bushels of grain. It enables both individual growers and cooperative organizations to finance their stored commodities at lower interest rates. A large Oregon prune-growers' association, for example, paid 8 per cent interest before the warehouse facilities it used came under the Federal licensing system; thereafter the association obtained funds at 4 per cent through the intermediate credit banks. The commercial banks lowered their rates 2 per cent or more. Often the use of Federal warehouse receipts makes credit available where otherwise it would not be. In recent years the department has added numerous products to the list of those eligible for storage under the Federal warehouse act. Among these are pecans; English walnuts; filberts; cherries in brine; cold-packed fruit: and alfalfa, bluegrass, and bent-grass seed.

Commission Rates Reduced

Lower commission rates went into effect during the last fiscal year at several of the larger livestock markets. In some instances these reductions followed formal hearings and the issuance of orders by the Secretary of Agriculture under authority of the packers and stockyards act. In other cases the commission men, after conferring with department officials, acted voluntarily. The results, it is estimated, will be a saving to livestock producers of more than $1,000,000 annually in commission charges. Stockyard companies made reductions also in their feed charges, to the substantial benefit of producers.

Under the packers and stockyards act the department instituted formal proceedings during the fiscal year in 38 cases involving alleged violation of the law or the reasonableness of commission rates and charges. It took final action in 27 of these cases and in 11 others pending from the previous year. It suspended violators of the law from business or required them to cease unfair practices. Other cases involved shippers' damage claims or actions to protect shippers from losses through dealings with insolvent market agencies. Several court decisions facilitated the enforcement of the act. In the so-called National Stockyards boycott case, a Federal court approved an order issued by the Acting Secretary of Agriculture requiring certain market agencies to cease discriminatory practices. The order also suspended the registrations of these agencies. Another Federal court, in a decision involving an order prescribing rates to be charged by the

Denver Stockyards Co., declared the Secretary has authority to value stockyard properties as a basis for fixing rates. In certain methods of making valuations and in other procedures, however, the court did not sustain the Secretary's action.

Perishable Commodities Act

Recent legislation passed to suppress unfair or fraudulent practices in the fruit and vegetable trade gained increasing support from growers and shippers. Both groups took more advantage of its provisions. They had supported the legislation when it was under discussion; they found its enforcement a benefit. This was indicated by an increase of 62 per cent in the number of complaints filed for settlement under the perishable agricultural commodities act in the fiscal year ended June 30, 1932. The fact that more complaints were filed did not, of course, mean that disputes increased in the fruit and vegetable trade. It meant simply that disputants used the law increasingly. An average of 48 complaints came in each week, or a total of 2,482 during the fiscal year. More convincing of the utility of the legislation than the number of complaints filed under it was the fact that few of them necessitated public hearings and decisions. Only 16 per cent had to be dealt with in that way. The others yielded to more or less informal arbitration. They involved merely official interpretations of the law and recommendations as to its application.

More than half the complaints filed under the perishable agricultural commodities act in the last fiscal year alleged failure to account correctly either for produce handled on a commission or for the price of goods sold. About a third of the complaints alleged the rejection of shipments without reasonable cause. Thirteen per cent alleged failure of the shipper to make delivery in accordance with the terms of sale. The Secretary held public hearings in 176 cases as compared with 13 during the preceding year. He gave decisions in 80 cases, as compared with 4 the previous year. In 48 cases he awarded damages. At the close of the fiscal year, 15,327 licenses issued to commission merchants, dealers, and brokers were in force. Under the produce agency act of 1927, the department received 189 complaints, 17 of which resulted in convictions in Federal courts.

Game-Law Ruling Conserves Waterfowl

In the spring and summer of 1931 migratory waterfowl in the United States decreased alarmingly. The decrease followed several years of drought in the principal breeding grounds of these birds. It necessitated drastic restrictions on hunting. Accordingly, by a regulation approved August 25, 1931, the department reduced the open season to one month. Simultaneously the President of the United States in a proclamation called attention to the situation and to the regulation and urged its full observance. This action materially reduced the kill of waterfowl. The results were so good and field investigations showed such improvement in breeding conditions that the department fixed the 1932 fall and winter hunting season at two months. It was evident that sportsmen had cooperated in the effort to conserve waterfowl and that a much larger number of birds than otherwise would have survived had returned to the breeding grounds.

Food and Drugs Act

Administration of the food and drugs act necessitated as usual so many different types of activity that in this report it must suffice to give only a few illustrations of the way in which the department strives to insure the purity of foods and drugs. Congress appropriated increased funds for the work in the fiscal year 1931–32. This enabled the department to institute 1,307 prosecutions, as compared with 547 in the preceding fiscal year. The department took legal action against 739 shippers or manufacturers of adulterated or misbranded foods, 471 shippers or manufacturers of adulterated or misbranded drugs, and 97 manufacturers of livestock feeds. It analyzed a great variety of products, seized 908 stocks of adulterated or misbranded foods and 328 consignments of drugs, and examined 10,316 samples of imported foods and drugs, out of which number 3,744 were held not to comply with the food and drugs act. The drug seizures included 14 shipments of misbranded veterinary remedies.

Producers as well as consumers benefited from rigid control of spray residues on fruit. This control held down residual arsenic on export fruit to the tolerated point, and kept open foreign markets that might otherwise have been closed. Foreign governments recognized the department's efforts and refrained from imposing embargoes. Spray-residue control strengthened the domestic market also because it lessened nervousness about the danger of poisoning. The department seized many consignments of cabbage and celery containing excessive spray residue. There is no export problem in the case of vegetables, but there is a domestic problem. Had illness developed from failure to prevent the marketing of vegetables bearing too much spray residue, the injury would not have been confined to the unfortunate consumers. It would have hurt producers—*those whose products complied with the food and drugs act as well as those whose* products did not.

Inspections revealed steady progress toward higher standards of purity and wholesomeness in foods. For the third successive fiscal year the department discovered no case of botulism poisoning that could be attributed to commercially canned foods. Inspections of canned goods showed an advance in quality standards. The pack of blueberries, for example, was almost entirely free from the blueberry maggot—troublesome in previous years. Federal and State research showed how to accomplish this result. In a few cases, food samples examined by department specialists contained decomposition attributed to bacteria. Usually these products came from plants not having the best processing facilities, and the department kept them under surveillance. The department caused seizure of 133 consignments of fish infested with parasites. Inspectors encountered violations of the law in shrimp packed by 19 different companies. The shrimp was either short weight or decomposed or both. Exact methods of detecting decomposition in canned shrimp probably will result from experimental work now under way in the department.

Enforcement of the law as it applies to drugs had some notable results. The Federal court at Baltimore, Md., upheld the department in seizing stocks of a drug preparation called "B. & M. External Remedy." This was a liniment shown by analysis to consist largely of water, ammonia, turpentine, and egg. The manufacturers labeled

it as useful for many diseases, including tuberculosis, pneumonia, and influenza. Medical authorities testified that the preparation could *have no remedial value in the diseases mentioned on the label.* The jury found the article misbranded, whereupon the department ordered it seized wherever found in Federal jurisdiction.

It is believed that stocks of adulterated "ginger jake," which several years ago caused many thousand cases of paralysis, have been removed from the open market. In a search for stocks the department worked with the Federal prohibition forces and other governmental and State organizations. Search for hidden stocks will be continued. Two persons responsible for the original manufacture and distribution of the poisonous ginger, when prosecuted on charges of violating the food and drugs act and the prohibition law, had, in a previous year, pleaded guilty to a conspiracy charge. The court fined them, but suspended prison sentences. In April, 1932, on evidence collected by this department, the court revoked the suspension and sentenced one of the offenders, the president of the now-defunct manufacturing company, to prison for two years. The department also gathered evidence which resulted in the indictment of members of a second group of manufacturers and distributors of ginger jake. Other actions involving ginger jake are pending.

Inspections of anesthetic ether showed that the quality of this product continues to improve. Only 5 per cent of the cans examined last year proved below the standard of quality established by the United States Pharmacopœia. The department removed from the market various medicines falsely labeled as curative in livestock diseases such as contagious abortion, shipping fever, fowl cholera, roup, and bone diseases.

Under the Federal insecticide and fungicide act, the department analyzed 1,678 samples of insecticides and fungicides, and tested many of these preparations under field conditions. The samples included preparations considered vital in the control of destructive insects. Forty-nine alleged violations of the insecticide law were reported to the Department of Justice.

FEDERAL-AID ROAD CONSTRUCTION

The mileage of Federal-aid roads on which improvements were completed during the last fiscal year reached the unprecedented total of 15,997; in the preceding fiscal year improvements were completed on 11,033 miles. Of the 1932 total, 11,037 miles were classed as initial improvements; the remainder consisted of advanced stages of construction on 4,925 miles of roads previously improved to some degree and of 35 miles of reconstruction.

The total cost of the projects completed during the fiscal year 1932 was $317,216,272, of which $144,720,610 was paid outright by the Government as regular Federal aid. A portion of this was advanced from an emergency appropriation. In the fiscal year 1931 the total cost of the projects completed was $255,088,414, of which the Federal share was $105,918,451.

Comparison of these figures indicates a considerably greater expenditure by Federal and State Governments for roads completed in 1932 than for those completed in 1931. However, expenditures upon these projects overlap the fiscal years; the actual disbursement of Federal-aid funds during the fiscal year 1932 was really less than

during the preceding year—$127,367,120 as compared with $133,340,-911. These disbursements in both years included all sums expended upon road work—that is, sums paid for work in progress as well as sums paid at the completion of projects.

The newly completed projects brought the total mileage classed as completed to 101,032 miles. This included all roads upon which improvements of any degree had been made, except 2,626.5 miles on which stage construction or reconstruction was in progress at the end of the fiscal year.

The total mileage improved with Federal assistance amounts to about half that in the Federal-aid system. It includes more than 484 miles of bridges more than 20 feet in span, and their immediate approaches, 43,003 miles surfaced with high-type pavements, 6,482 miles with intermediate-type surfaces, and 38,841 miles with low-type surfaces, with 12,222 miles unsurfaced but graded and drained to satisfactory standard. Nearly 20,000 miles were afterwards further improved by the States without Federal aid. At the close of the fiscal year 1932 Federal-aid road work was in progress on 10,512 miles.

Emergency Funds

The $80,000,000 emergency appropriation made by Congress on December 20, 1930, hastened the beginning and increased the volume of road-construction work. The sum was to be advanced to the States for use by them in matching the regular Federal-aid funds available. It was to be reimbursed to the Federal Treasury without interest, by deduction from anticipated future apportionments of Federal aid. The purpose of the emergency appropriation was to supplement depleted State revenues and to permit increased employment on road work. Congress stipulated that only such part of the appropriation should be available as had been actually expended for work completed by September 1, 1931.

As a result, the employment of labor on road projects supported in whole or in part with Federal funds rose sharply from less than 20,000 men in January, 1931, to nearly 55,000 in March, and to 154,500 by June, exceeding by more than 90,000 the number employed on similar work in the same month of the previous year. The peak of employment was reached in July, the first month of the last fiscal year, when an average of 164,700 men were employed daily. Thereafter the number so employed dropped to 151,400 in August and in September, with the emergency funds no longer available, to 116,000.

In direct employment the Federal advance of funds could have no effect after September 1. Its indirect benefits, however, continued throughout the calendar year and well into the spring of 1932. State funds saved from expenditure earlier in the season were available for the continuance of work in greater than the usual volume. Consequently, while employment on Federal projects fell off from July to September, the number of men employed on projects financed entirely with State funds increased from 112,600 in July to 123,400 in September. There was a gradual decline from this peak as the fall advanced and winter set in. Nevertheless, the combined Federal and State funds sufficed to maintain total employment at an unusually high level. In January, 1932, rural-road work of all kinds employed 229,200 men as compared with 148,600 in the same month of the preceding year. The total of highway employment, exceptionally

large in the spring of 1931 by reason of the Federal advance, remained even greater in 1932 until April. Out of the emergency advance appropriation of $80,000,000, a total of $79,203,719.20 was expended for road work completed prior to September 1, 1931, as required by the law. Federal and State officials had unusual success in smoothing out administration difficulties and in getting quick action. The cooperative experience gained augurs well for the successful administration of another advance provided by the emergency relief and construction act of 1932; this act provides $120,000,000 for advances to the States which they may use to match Federal-aid funds, $5,000,000 for the construction and improvement of national forest highways, $5,000,000 for forest-development roads and trails, $3,000,000 for the construction and improvement of national park roads, $1,000,000 for Indian reservation roads, and $2,000,000 for public-land roads.

National Forest Roads and Trails

Two bureaus of the department deal with road construction in the national forests—the Bureau of Public Roads and the Forest Service. The Bureau of Public Roads builds main through roads to connect with Federal-aid highways. The Forest Service builds lateral roads of a simpler type, and trails. This road and trail construction work during the fiscal year 1932 was marked by the introduction of new methods and better equipment which resulted in greater efficiency and lower costs. The cost of building 2,736 miles of forest-development roads, which are in the nature of well-constructed truck trails, averaged $903 per mile. This was a decrease of more than $400 per mile from previous average costs of the same type of roads. The cost of foot trails was decreased $16 per mile to an average cost of $128 for 6,875 miles constructed. In addition, 603 miles of high-standard forest highways were built under the supervision of the Bureau of Public Roads. The system of roads and trails now planned for the national forests amounts to 68,222 miles of truck trails, 165,058 miles of foot trails, and 16,275 miles of high-standard forest highways. At the close of the fiscal year, 20,238 miles of truck trails, 68,812 miles of foot trails, and 5,242 miles of forest highways had been completed. Maintenance costs also were slashed by the use of the better methods and equipment. Roads in the truck-trail class are now kept in good repair at an average cost of less than $20 per mile.

ARTHUR M. HYDE,
Secretary of Agriculture.

AGRICULTURE and THE WORLD CRISIS

FARMERS Specially Hard Hit Because Costs Have Not Fallen With Prices

For the fourth time in the last 150 years American agriculture is experiencing the aftermath of war-time price inflation. Just as after the abnormal war-time price peaks of 1780, 1814, and 1864, so since 1920 farmers have labored under difficulties of distorted relations between costs and the prices received for their products.

Farm-commodity prices dropped about 50 per cent in 1920 and 1921, whereas nonagricultural prices declined only about 25 per cent. This maladjustment gave rise immediately to a difficult farm problem. Following the postwar slump of 1920–21, farm-commodity prices, even though remaining between 30 and 45 per cent above the pre-war level, were so seriously out of line with nonagricultural prices and with the chief items of farm expense that many farmers could not meet their bills. What happened after 1929 made a bad matter worse.

Succeeding articles in this Yearbook examine the effects of the depression on various branches of agriculture, report new discoveries relative to different crops and classes of livestock, and suggest methods that help farmers reduce costs of production. Certain effects of the crisis bear, however, on all branches of the agricultural industry in varying degrees. Notable among these effects are the general price decline, the lag in adjustments between farm prices and fixed obligations, the decline in consumer demand, and the restrictions that many countries have placed on international trade. This section of the Yearbook therefore discusses tbe depression in its relation to agriculture as a whole.

Detailed statistics about prices, gross income, mortgage debt, taxes, and so forth, omitted here, appear in the Secretary's report to the President and in the statistical section of the Yearbook. This article indicates the nature of the problem with which agriculture and the Nation must deal. Essentially it is a price problem. From the farmers' standpoint, the present agricultural crisis traces back to the general drop of prices in 1920 and the more disastrous reaction that began in 1929, and to the disproportionate fall of farm prices. This reaction reduced the demand for commodities and enormously increased the burden of debt. No attempt will be made here to go into the causes of the general price slump, because the problem far transcends the agricultural field. The effect upon agriculture is the present concern.

Nonagricultural Factors in the Crisis

The fall in general prices that began in 1929 was an outgrowth of a series of domestic and foreign developments in financial, industrial, trade, and political conditions. The decline in farm prices during the first two years of this depression, 1929–30 and 1930–31, accompanied the contraction in business, in speculative activity, and in the industrial and consumer demand for farm products here and abroad. Another sharp reduction in farm prices occurred during the 1931–32 season. This was only partly the result of increased yields per acre of a few crops, such as cotton and fruits and vegetables. It was chiefly associated with financial crises and a breakdown in monetary standards that led to further restriction of credit and to deeper industrial stagnation. The 1931–32 season was marked by panic and by fear-engendered demand for money to be hoarded instead of used in buying commodities, securities, and property, the values of which were rapidly shrinking. American agriculture suffered from the influences of these forces that were beyond its control.

The overwhelming importance of these nonagricultural factors as causes of the prevailing depression in agriculture is strikingly evident

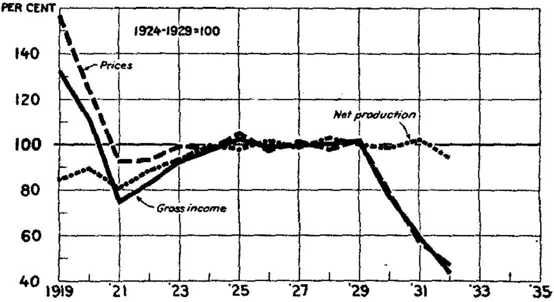


FIGURE 1.—Indices of net agricultural production, prices, and income in the United States, 1919–1931

in the course of farm production, prices, and income since 1924. (Fig. 1.) During the period 1924–1932, the total output of farm products was remarkably stable, on a level about 15 to 18 per cent above the relatively low production of 1919–1921. By 1924–1926, largely through a recovery in cotton production more nearly in line with the pre-war rate of growth and through an expansion in dairy and poultry production and in truck crops, the total farm production of the country was restored to approximately the same relation to the growth of our population that had existed for a number of years before the war. Since then it has failed to keep pace with population growth. In 1929, the year that marks the beginning of this industrial depression, the total farm output was 3 per cent lower than that of 1928 and not above the average for the five years 1924–1928. Except in a few commodities, there was no unusually large domestic farm production when the depression set in.

During the years 1924–1929, when domestic industrial conditions were generally at prosperity levels, the yearly variations in total farm output were offset by opposite changes in the average of prices received by farmers, and total gross income remained fairly stable. But in 1930, when production fell below that of 1929 by about 2 per cent, a decline that ordinarily would have resulted in prices 2 to 3 per cent above those of 1929, prices actually fell about 20 per cent, and gross income about 22 per cent. Clearly the principal cause was a change in the general financial and industrial situation both in the United States and in other countries.

Effects of the Depression on Agriculture

One of the first impacts of the 1929 financial and speculative crash on agriculture occurred in the speculative-commodity exchanges where cotton and grain prices declined with the fall in security prices. The immediate effect of curtailment in industrial demand as factories reduced their working forces was a piling up of stocks and a fall in prices of raw materials like cotton. The immediate effect of increasing unemployment and contracted consumer incomes was to reduce consumer expenditures for food and clothing. Those commodities of which farmers continued to send a fairly even flow to market could be disposed of only at reduced prices. Even those commodities whose output was reduced by poor growing conditions suffered price reductions. By the end of 1932, when nearly a third of all persons formerly gainfully occupied outside of agriculture were unemployed, and millions were working part time at reduced wages, farm-commodity prices fell to about half of the pre-war level. The gross income of nonagricultural industries, indicative of incomes of consumers in general in the United States, fell from $159,000,000,000 in 1929 to about $80,000,000,000 in 1932. The national income, which in 1929 had reached $91,000,000,000, was probably somewhat under $55,000,000,000 in 1932. Gross farm income shrank even more, from $12,000,000,000 in 1929 to $5,000,000,000 in 1932. Farmers received for their 1932 output 60 per cent less than they received for a similar crop before 1929.

Other influences affecting the American farmer and occurring simultaneously with the general fall in prices and curtailment in domestic consumer incomes, arose from restrictions of credit, as thousands of country banks suspended operations. Still others are traceable to reduced foreign demand, erection of new trade barriers, increased foreign competition and restrictions on the use of foreign exchange in the purchase of American exports. These are reflected in a great reduction in both the value and the volume of our agricultural exports and in the large stocks of wheat and cotton. The quantity of agricultural exports from the United States was fairly well maintained during the 1924–1928 seasons, but in the 1930–1931 and 1931–32 seasons total volume was about 20 per cent less than in the season 1928–29. In 1931–32, however, the value of these farm exports was about 60 per cent less than in 1928–29. This may be compared with the reduction of 60 per cent in both exports and imports in the total international trade of 40 countries, between January, 1929, and January, 1932.

The collapse in farm prices brought with it great disparities in agricultural price relationships. Taking into account such varying reductions as had occurred in farm wages, goods bought by farmers, taxes,

and interest charges since 1929, by the autumn of 1932 aggregate farm costs had declined only about 20 per cent in contrast with a fall in farm prices of about 60 per cent. Compared with their pre-war averages as 100 per cent, the average of the farm costs was still about 140 per cent, whereas farm prices had fallen to about 55 per cent. The prices of major cash crops, being more subject to international influence, at first suffered more than did the prices of livestock and livestock products, that are consumed almost entirely in the domestic markets.

But no group of farm commodities has escaped. Dairy products and meat animals were in increasing demand before the depression; on the other hand, field crops like corn, oats, barley, and hay had suffered a declining demand because of an increase in power farming which reduced the number of work animals. Nevertheless, prices of both these groups of commodities have fallen drastically. Between September, 1929, and September, 1932, the average of prices received by farmers at the farm declined 58 per cent; grain prices fell 69 per cent, cotton 61 per cent, meat animals 58 per cent, and dairy and poultry products 51 per cent. At wholesale markets, the average of prices of farm products declined 50 per cent.

Exchange Value of Farm Products Lowest in Sixty Years

In the same period prices of nonagricultural products declined only 25 per cent and prices paid by farmers for the things they usually buy declined during this interval from 155 per cent of their pre-war average to 108 per cent, hardly enough to counteract the much greater decline in prices received. Consequently, the exchange value of a unit of farm products was only 56 per cent of the pre-war level in September, 1932, compared with 91 per cent in 1929. On the same basis, a bushel of wheat exchanged for only 37 per cent as much, 100 pounds of hogs for 42 per cent, a pound of wool or a pound of cotton for about 50 per cent, a pound of butter for 72 per cent, and a dozen eggs for 88 per cent. In the case of many farm commodities the purchasing power was lower than at any time during the last 60 years.

The ratio between prices and costs has now become disastrous. While farm-commodity prices at the beginning of 1933 had fallen until they were about half of the pre-war prices, relatively fixed farm expenses, particularly debt charges and taxes, had declined only slightly. Farm-mortgage debt in 1932, in comparison with gross income, to say nothing of net income, was between three and four times as heavy as before the war. Taxes had more than doubled and it took about four times as many units of farm products to pay them. Mortgage interest and taxes combined absorbed almost 25 per cent of the gross farm income in 1932, as compared with only 7 or 8 per cent before the war and 11.2 per cent in 1929.

Effects Are of Far-Reaching Nature

The 1929–1932 general depression has thus further aggravated the farm situation, and the inability of a large percentage of farmers to meet their overhead or fixed charges has brought far-reaching results. A rapid decline in farm-land values has reduced the farmer's equity in his property and has weakened country and city lending institutions. Mounting tax delinquencies have caused large areas of land to revert to the ownership of counties and States. Thousands of farmers have

reverted from ownership to tenancy. The widespread inability to pay mortgage interest and principal when due has resulted in a great increase in forced sales of farms, mortgage foreclosures, and in the voluntary release of farm land to creditors. Hundreds of thousands of farmers have been forced to a lower standard of living in which food and shelter are the chief reward for labor and investment. The normal escape from these unremunerative conditions has been shut off by lack of employment opportunities in other occupations. In fact, the unprecedented volume of city unemployment has led to a movement of population to the country, and this movement has reduced the city demand for commercial farm products and has added inopportunely to the current difficulties of adjusting farm production to curtailed demand.

Some of the readjustments that have already occurred tend to exert long-time influences on agriculture. The sharp reductions in farm-labor costs and in costs of certain raw materials and supplies used in production, while they have helped farmers during the period of falling receipts, indicate a much lower cost basis for agricultural production. The lower level of land values is another factor in lowering future production costs.

Furthermore, the economic forces that have created the unusually wide gap between farm and nonagricultural prices are not readily removed. These forces include: Costs of transportation and processing that remain relatively inflexible during a period of general inflation; the inability of farmers to make drastic adjustments in output, which creates a condition of relative abundance of farm products in contrast with the sharp curtailment in industrial production, the latter tending to sustain industrial prices and at the same time to retard the domestic demand for farm products; a shift in population from cities to farms that not only reduces consumer demand but also adds to the total supply of farm products; increased agricultural production abroad which tends to maintain an abundance of agricultural products throughout the world and to reduce our export demand; and a slowing down in the rate of population growth which affects long-time domestic demand prospects, particularly for food products.

L. H. Bean, *Bureau of Agricultural Economics.*

COTTON √

AMERICAN Cotton Holds Ground Despite Growth of Foreign Competition

For the second successive year cotton prices have been near the lowest levels in the history of commercialized cotton growing in the United States. *The decline of cotton prices from among the highest in history,* as measured in purchasing power, in 1923, to among the lowest, in 1931 and 1932, has presented a succession of challenges to American cotton growers and to the whole economic system of the Cotton Belt. Many adjustments made to meet the difficulties could well be continued permanently, but some expedients that have been adopted are suited only to temporary situations, and others are undesirable, even if temporarily used. The final outcome will largely depend upon subsequent developments in the world situation to which American cotton growers must adjust themselves, and those developments are uncertain. But as the panic stage that accompanied the price decline passes, certain facts that have an important bearing on the future of the American cotton-growing industry become clear.

The outstanding forces that led to the present cotton situation were general deflation in commodity prices and declines in business activity and consumer incomes throughout the world. In addition, developments under way in cotton production and in the cotton-textile industries of the world were likely to lead to a crisis and a depression in cotton regardless of the situation in other industries. The extent and importance of these changes can be seen more easily by studying the pre-war situation.

Before the World War the cotton situation was in a state of approximate balance. On the supply side, production was increasing gradually in the United States and in foreign countries, but this was a part of the general world development of the period, and although there were years of crop surpluses, when prices were very low, and years of shortages when prices rose, adjustments that soon corrected the situations were made. The United States crop dominated the world markets, as this country produced two-thirds of the world's cotton outside of China. Nearly two-thirds of the American crop was exported. In the textile industries changes were gradual and in response to the general development of the period. In this country consumption in the mills of the cotton-growing States had come to exceed that in the New England States, but the industries were expanding in both sections. Abroad, spinning and weaving mills were increasing in number in many countries, but there was nothing

disruptive about this growth. Cotton-textile industries were most developed in Europe with Great Britain the outstanding foreign cotton-manufacturing country. Over 85 per cent of the cotton exports from the United States went to the United Kingdom, Germany, France, and Italy; 40 per cent went to the United Kingdom alone.

Post-war Cotton Production

The cotton situation was thrown far out of balance in the early post-war period by a 3-year cotton shortage, and the reactions are still evident. (Fig. 2.) The boll weevil had been progressing eastward and northward since the early nineties when it crossed the Rio Grande into Texas. But prior to the war the damage was localized and did not greatly affect the crop as a whole. By 1921 the weevil had spread over most of the belt; in that year it caused an estimated average reduction in yields of over 30 per cent. The damage was

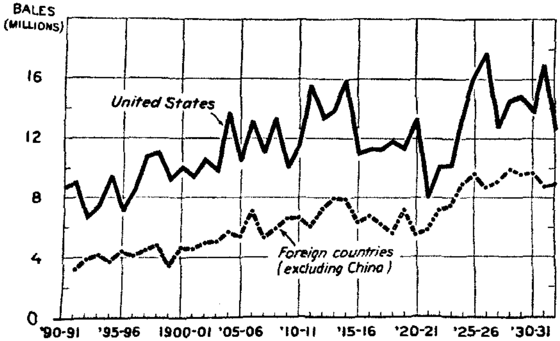


FIGURE 2.—Cotton production in the United States and in foreign countries in crop years 1889–1891 to 1932–33. Following the low period of 1921 cotton production rose sharply in response to high prices. Since 1928 the trend of foreign production has been downward

severe in 1922 and 1923. In Georgia the yield fell from the high points of about 240 pounds per acre in 1911 and 1914 to about 80 pounds in 1923. In Florida the yield dropped to 40 pounds per acre. The effects of this damage were far reaching and prompt. In some sections cotton production was nearly abandoned, and the farmers who continued to grow it had little confidence in their success. Many cotton farmers left the sections most severely affected. Production was so reduced that prices rose to the highest peace-time level since 1800, except for 1919–20 when war-time inflation was an outstanding price factor.

The short crops in 1921, 1922, and 1923 were accepted by many persons as indicating that United States domination in world cotton production had ended. Foreign cotton-mill interests fostered and even subsidized cotton production in foreign countries. These efforts, and the high prices of cotton, caused an expansion in foreign production that was to prove a serious problem for American pro-

ducers. In the United States, farmers in nonweevil sections turned to growing the high-priced cotton. Significant increases in cotton acreage took place in the northern edge of the Cotton Belt in the Atlantic Coast and Mississippi Valley States, but by far the greatest expansion occurred in the West. In Texas, cotton production rose from 2,200,000 bales in 1921 to 5,600,000 bales in 1926; and in Oklahoma it rose from 480,000 bales in 1921 to 1,770,000 bales in 1926. Moreover, farmers were learning to produce cotton under weevil conditions. In 1926, 47,100,000 acres of cotton were harvested in the United States, compared with 30,500,000 in 1921. With high yields, the 1926 crop amounted to 18,000,000 bales as contrasted with the short crop of 8,000,000 bales in 1921. Cotton production in foreign countries rose from 5,800,000 bales in 1920 to 9,700,000 bales in 1925. The deficit years of 1921 to 1923 had given way to years of the largest crops in history.

The low prices in 1926 checked expansion, but world production continued at a high level. When the depression began to be felt in the cotton industry the full significance of foreign competition was recognized by American producers. World consumption of Indian and other foreign-grown cottons reached record levels in 1929–30, whereas world consumption of American cotton fell 2,000,000 bales that year. To some persons this suggested that foreign producers grew cotton at such low costs that they could, in large part, force American cotton out of the world markets. To others it meant that American cotton had so deteriorated that foreign mills no longer wanted it. The first conclusion overlooked the fact that the United States had won and held its position in world markets because of its comparative advantages in cotton production. The second overlooked the fact that most cottons being substituted for American cotton at that time were inferior to American cotton. Mills turned to the large available supplies of low-priced foreign cottons at the expense of quality, in order to meet price competition in the finished-goods markets.

Cotton production in foreign countries fell from 9,950,000 bales in 1928 to 8,700,000 bales in 1931. Excluding Russia, the reduction was even greater—from 8,780,000 bales to 6,850,000 bales. Crops in China and India were particularly small in 1931; but although the Chinese crop has become large again in 1932, the Indian crop remains rather small and Indian acreage was again reduced in 1932. The crops in Egypt and several of the minor producing countries have been reduced in 1932. Increases in Russian production give little prospect of exceeding increases in consumption in that country. Obviously the upward trend in production in many foreign countries will be resumed when conditions become more normal, but it is clear that these countries are not in a position to expand the industry under conditions like those of the last two years.

The 17,100,000-bale crop harvested in the United States in 1931 was far in excess of world consumption of American cotton that year. From the standpoint of sustaining prices and reducing stocks this was unfortunate, but it resulted in American farmers making significant recoveries of world cotton markets. The fact that farmers in this country continue to hold their position in world [illegible] pre-vailing low prices reflects the deg[illegible] ucing cotton in comparison with other [illegible] other

LIBRARY
[illegible] Coimbatore - 3

The contraction of 18 per cent in cotton acreage in the United States from 1929 to 1932 came largely because southern farmers adopted a more self-sufficing type of agriculture, producing more of their own food and feed crops. This makes them less dependent upon cash income and strengthens their position in meeting unfavorable market conditions.

Post-war Cotton Consumption

The World War gave a decided impetus to cotton manufacturing in oriental and a number of other countries. New spindles were added at a rapid rate, and were more efficient than the old spindles that remained. This upward trend continued practically unabated until the present general depression began. The largest increases occurred in the Orient, but countries elsewhere (like Brazil) that were formerly large importers of cotton goods, and continental European countries, especially The Netherlands, Belgium, and Italy, increased the number of their spindles.

While world demand was improving, the growth in the textile industries appeared helpful to the American cotton producer. Exports to many countries increased, for the textile industries of those countries were active. But exports to Great Britain never recovered to the pre-war high point—the British textile industry remained in a state of chronic depression—and in continental Europe, established trade channels for cotton textiles were broken by tariffs created to foster developing industries.

The cotton-textile industry of Austria was first depressed, then the Polish industry. Gradually China and India supplied a larger part of their own textile requirements. Japan practically ceased to be an import market and became a leading exporter, supplying larger and larger proportions of textiles to the Asiatic import markets. The Indian boycott against foreign goods further depressed British export trade in cotton goods. Markets were receding while efforts to increase output and exports were increasing. As more industries became depressed they offered more severe competition in the textile markets. The whole cotton-textile industry was unusually susceptible to general depression, which made its effects more difficult to combat.

One of the most important effects of the shift of cotton-textile manufacture to the Orient was the intensification of competition between American and Indian and, to a lesser extent, Chinese cotton. Oriental mills have long used some American cotton, and are tending to use more of it, but they depend mostly upon Indian and Chinese growths; they shift in response to relative prices. In addition, European mills nearly doubled their use of Indian cotton in the post-war period and increased their consumption of cotton from other foreign countries almost threefold. As the depression continued and price became a more important factor in textile sales, European mills increased their consumption of Indian and other cottons while decreasing their consumption of the higher priced American and Egyptian growths.

Even after the depression passes, mills are likely to continue responsive to relative prices in selecting their cottons, thus sharpening competition between growths. It is to be expected that over a period of years world-consumption figures will show that increasing quantities of foreign cottons are being used. A gradual development of this nature would not be unsatisfactory to American growers. A suggestion of the possible future increase in world cotton consumption if other countries

should develop along the same lines as has the United States, is found in the fact that per capita consumption of cotton in this country is approximately 2 times that of Great Britian, 2½ times that of Japan, 3½ times that of Italy, 4 times that of China, and 6 times that of India.

The Present Depression

The present depression began to be reflected in the cotton-textile industry of Germany in 1928 and the consumption of American cotton in Germany fell 250,000 bales in the 1928–29 cotton year. The depression did not become general until 1929–30, when world consumption of American cotton fell to 13,000,000 bales, whereas it had exceeded 15,000,000 bales in each of the preceding three years. The consumption of Egyptian cotton fell also, but that of Indian and other cottons increased. The Orient about maintained its consumption of American cotton in 1929–30 but increased its consumption of other growths. Europe decreased its consumption of American cotton, but increased its consumption of other growths. Cotton consumption in the United States fell. In 1930–31, world consumption of American cotton was a little below 11,000,000 bales. In contrast with the preceding year, however, consumption of foreign cottons declined too, although less than that of American cotton. The situation in 1931–32 was the complete reverse of that in 1929–30, for in the latter year world consumption of American cotton gained 1,400,000 bales at the expense of Indian and other cottons. The large stocks of American cotton that had been accumulating since 1929, together with the large crop, made the 1931–32 supply of American cotton the largest on record. The Indian and Chinese crops, on the other hand, were unusually small in 1931. As a result, prices of American cotton became low as compared to those of foreign growths. European mills used more American cotton and less foreign cottons. The greatest change took place in Asia where the consumption of American cotton increased 1,300,000 bales, largely offset by decreases in consumption of foreign growths. Japan became the largest foreign consumer of American cotton, and China ranked ahead of Germany. Part of the increases in foreign consumption of American cotton was offset by decreased consumption in the United States. Reports in the early part of the 1932–33 cotton year showed exports to the Orient to be holding much of the previous year's gain, whereas exports to Europe had increased further and United States consumption had recovered materially.

Cotton prices are particularly sensitive to changes in the general level of commodity prices. In periods of inflation they tend to rise more and in periods of deflation they fall more than does the average of all prices. Cotton prices have fallen more in the deflation period since 1929 than has the average of commodity prices, as was true in 1920–21. In both periods consumption fell sharply and stocks accumulated; and as supplies rose they became increasingly burdensome. But in production the parallel breaks. Owing to boll-weevil injury, the crop in 1921 was the smallest in 26 years, whereas the highest yields in 17 years made the 1931 crop second in size only to the 1926 crop. The record supply of 1931–32 exceeded two years' consumption. More than the equivalent of a year's consumption of cotton was carried over into 1932–33, and when production was added, the supply was again in excess of two years' consumption. (Fig. 3.) This supply, together with the falling commodity price level, continued to hold prices in

1932–33 close to the previous year's level. But during a period of increased buying of cotton textiles in the fall of 1932, cotton prices rallied materially, showing the extent to which an improvement in demand could raise cotton prices even in the face of a large supply and a low price level.

Quality of Cotton

Quality is of major importance in the competition between American and foreign cottons and among different American cottons. Some of the differences in cotton quality are understood, but lacking a full understanding of the fundamentals of cotton quality and its significance in manufacturing, much of its influence upon competition remains unknown. A practical illustration is found in the fact that in the 12 months ended July 31, 1932, some 85,000 bales of foreign-grown cotton were imported into the United States. Much of this cotton was brought in over a tariff wall of 7 cents a pound and sold to manufacturers at prices in some cases nearly twice those commanded by American-grown cottons of like grade and staple, of which the supply in this

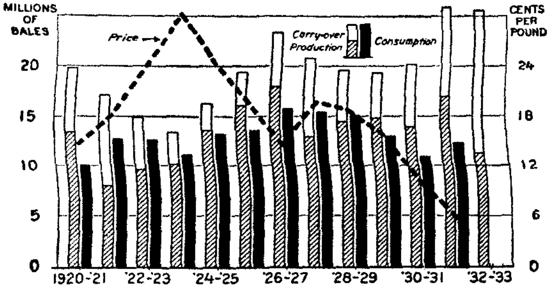


FIGURE 3.—Production, world consumption, world carry-over, and price of American cotton, 1920–21 to 1932–33. From 1921 to 1926 changes in supplies dominated the trends of cotton prices. After 1929 low consumption and excessive supplies both depressed prices

country throughout the year was more than abundant. This economic paradox, so vividly evident in our own country, illustrates to some degree how competition of other growths with American cotton in foreign markets is affected by factors of quality which, at present, lie beyond the borders of established knowledge. It challenges the best efforts of agricultural-research agencies to discover more about the nature of cotton as it affects manufacture and utilization, and the endeavors of breeders, growers, and ginners to make the fullest and most useful application of these facts as rapidly as research can disclose them, to the end that American-grown cotton shall possess whatever elements of quality, are essential to its choice by manufacturers in the markets of this and other countries.

The shorter-staple American cotton meets its greatest foreign competition from Indian and Chinese cottons. Production of American cotton with staples shorter than seven-eighths inch has decreased markedly during the last three years. The small crops of Indian and Chinese cottons in 1931, and the demand for low-priced raw materials,

helped to maintain the consumption of the shorter-staple American cotton. As a result, stocks of staples shorter than seven-eighths inch in the United States are low and prices of this cotton have not declined as much as those of the longer staples. (Fig. 4.)

The long-staple cotton of the United States meets important foreign competition from Egypt, Brazil, Peru, Uganda, and Anglo-Egyptian Sudan. Of these Egypt is much the largest producer. Price-stabilization activities of the Egyptian Government resulted in an accumulation of large stocks of Egyptian cotton before the depression began, and the sales of fine goods were particularly depressed by the low consumer incomes. The foreign situation for this group of cotton has been helped by the curtailment in Egyptian production, and stocks are being reduced, but prices have fallen drastically. The tariff of 7 cents per pound on cotton that has a staple length of 1⅛ inches or more is keeping prices of foreign cottons of this group in the United States well above their respective world prices, and imports have declined. Prices of Pima cotton in the United States are holding close to their previous relationship to prices of Sakellaridis cotton in the United States, but prices of 1⅛-inch upland cotton have declined in comparison with

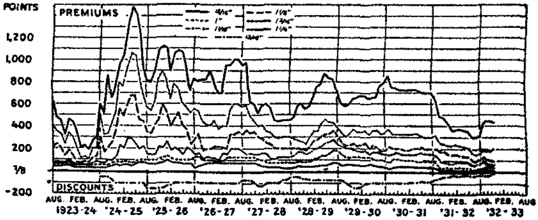


FIGURE 4.—Staple premiums and discounts, 1923–24 to 1932–33. Premiums paid at central markets for cotton of longer than ⅞-inch staple and discounts for cotton shorter than ⅞-inch staple, Middling grade, became very great in 1924–25, then lessened. In 1932 both premiums and discounts were unusually small

prices of Egyptian Uppers, even in foreign markets. Prices of 1³⁄₁₆-inch and longer upland cotton are stronger relatively than prices of 1⅛-inch and shorter premium types. These price relationships reflect the abundant supplies of 1-inch and 1⅛-inch cottons and the smaller supplies of 1³⁄₁₆-inch and longer cottons in the United States.

Disappearance of the shorter staples has been relatively greater than that of the longer staples each year, resulting in relatively smaller proportions of the shorter than of the longer staples in the carry-over at the end of the year. This tendency was especially marked in 1931–32, so that cotton carried over, in the United States, on August 1, 1932, shows relatively large proportions of the higher grades and longer staples, and a relatively small proportion untenderable on futures contracts.

Premiums and discounts for grade and staple length received by growers in local markets in the United States were considerably lower than those paid in central markets during the seasons of 1928–29, 1929–30, and 1930–31. The average premiums received by growers for grades above Middling averaged about 35 per cent of those paid in central markets. Discounts made to growers for grades below Mid-

dling averaged about 62 per cent of those paid in central markets. Price differences made to growers for staple length were even less than those made for grade. Premiums received by growers for staples longer than seven-eighths inch averaged only 16 per cent, and discounts made to growers for staples shorter than seven-eighths inch averaged less than 7 per cent of those quoted in central markets. Furthermore, the proportion of central-market staple premiums and discounts reflected in the prices received by growers decreased from 1928–29 to 1930–31.

Farmers who sold cotton through cooperative cotton-marketing associations received grade differences and staple premiums and discounts approximately equal to those paid in central markets. However, only a small proportion of the crop is marketed through cooperative associations. The proportion of American cotton marketed through large-scale cooperative associations reached a peak at about 17 per cent of the total crop in 1930–31, but decreased to about 13 per cent of the crop in 1931–32.

Cotton Utilization

Per capita consumption of cotton in the United States has averaged about 25 pounds and on the whole has shown little upward or downward trend for the last 30 years. In the World War period and in the period from 1926 to 1929, consumption exceeded this quantity and in the years of cotton shortage and during the present depression it has fallen below this average. Some pronounced changes in the utilization of cotton that have occurred during this period, however, have changed the position of cotton in the economic life of the country and appear to have made its consumption more subject to industrial fluctuations in the United States.

In foreign countries, especially in the Orient, cotton is used largely for clothing but in this country, although clothing probably is still the principal end product of cotton, a large and apparently increasing proportion of that consumed has been used for industrial purposes. Use of cotton in industry naturally fluctuates with changes in business activity. A period of increasing industrial activity would mean increased consumption of cotton whereas a downward movement such as occurred from 1929 to 1932 would logically be accompanied by a reduction in cotton consumption by industry.

Use of cotton for household purposes is susceptible to changes in the purchasing power of consumers but probably less so than in industry. The trend in household uses of cotton has been rather definitely upward. Clothing is probably the least susceptible of the three general uses for cotton, to influences of general business activity, but fluctuations do occur, as the result of changes in consumer incomes and the tendency on the part of manufacturers and distributors to accumulate stocks of cotton goods during prosperous times and to allow them to become considerably reduced when business is dull.

Changes in styles of clothing perhaps had as much influence upon changes in the utilization of cotton as any single factor. The decrease in the number and weight of undergarments worn by women may be cited as well as the lighter-weight underwear worn by men during the winter. Style changes that tended to reduce cotton consumption were accompanied by increased competition from silk and rayon. An example is found in hosiery. Approximately 90 per cent of all hosiery knit

in the United States in 1909 was made entirely of cotton, but in 1929 only 30 per cent was made entirely of cotton yarn although cotton was used with other fibers in a large proportion of the hosiery.

But increases in the use of cotton for some clothing items have occurred. The recent popularization of "styled" cotton dresses, the wearing of cotton summer suits by men, and the widespread adoption of beach pajamas have partly offset the decreases occurring in other items of clothing. Men's shirts and work clothing have continued as staple items through which large and increasing quantities of cotton have been consumed.

Increased use of cotton bed sheets, towels, cotton mattresses, mattress pads, and other articles, tended to increase the consumption of cotton. Awnings have furnished an outlet for large quantities, and the increased use of cotton in furniture upholstery and house furnishings generally has been noteworthy.

Increases had been greater than decreases in the industrial uses of cotton prior to the depression. The automobile was probably the largest single factor in the increases. It is estimated that in 1929 the automobile-tire industry alone accounted for approximately 10 per cent of the entire cotton consumption of the United States, while another 3 per cent was utilized in car tops, upholstery, brake bands, etc. These two industries combined, consumed almost a million bales annually. Rubberized goods other than tires, and artificial leather or pyroxylin-coated products, are other considerable items manufactured partly from cotton. Building trades use large quantities of cotton fabrics. The use of cotton for packaging such commodities as sugar, potatoes, and fruits has apparently increased during recent years. On the other hand, a decrease in the use of cotton for packaging some products, particularly cement and grain, has tended to decrease consumption. Jute and paper have been particularly serious competitors of cotton in industrial uses.

One result of these developments has been an increased dependence of cotton consumption, and therefore of the demand for raw cotton, on the industrial situation in the United States. The competition among textile fibers has been intensified also and this has an important bearing on the demand for raw cotton.

Transportation, Storage, and Market Organization

Recent developments in the transportation of cotton from producing areas to domestic mill centers and to ports, give promise of a far-reaching effect upon methods of packaging, lines of movement, time and place of concentration, and storage, as well as upon the marketing system for cotton. The development of a network of paved or otherwise improved highways throughout the Cotton Belt and, in certain areas, of inland waterways, followed by the extensive use of these facilities for the transportation of cotton by motor truck or by barge at rates substantially below those established by the rail carriers, diverted much of the cotton traffic from the railroads at least for a time. This shift has been accentuated during the present period by the comparatively low price of the product, which has necessitated using the most economical transportation facilities, and by the fact that the depression in the lumber, petroleum, and other industries of the South and Southwest has tended to divert motor equipment formerly employed in these industries, to the transportation of cotton.

Since trucks can be loaded to their maximum weight-carrying capacity with uncompressed bales, most of the cotton has been transported in this form. This has tended to bring to the port markets some cotton that, under conditions previously existing, was concentrated and compressed at interior markets, and was largely merchandized from there. The net result has been that compressing, storage, and other facilities at interior markets have been used less, whereas similar facilities at the port markets have in some cases been used to capacity.

Adoption of motor transportation for a considerable part of the cotton crop has had some effect upon the cotton-marketing structure. In certain instances the number of market agencies through which cotton passes while en route through cotton-marketing channels has been reduced, thus tending to more direct marketing.

Rail carriers have reduced their rates in order to regain a larger share of the cotton traffic. In an effort to reduce costs, most of the railroads operating in the Cotton Belt are now experimenting with rates based on various carload minima designed to promote a more efficient utilization of facilities than has prevailed under the any-quantity system of rates which has long been peculiar to the cotton traffic. The ultimate weight minima and differentials adopted in connection with these carload rates and the manner in which they are applied may influence to a considerable extent the future methods of baling, handling, and marketing the crop.

The Cotton Farm Situation

Gross farm incomes from cotton and cottonseed fell 62 per cent from 1929 to 1931, and income from the 1932 crop will apparently be around 70 per cent below that of 1929. These lowered incomes were soon reflected in reduced bank deposits and increased bank failures, decreased land values, increased mortgage foreclosures and tax-delinquency sales and lower standards of living.

The decline in farm earnings and in land values was closely associated with increases in forced sales of farms. It became increasingly difficult to pay, with low-priced products, the debts that had been incurred during a period of relatively high cotton prices and cheap money. It is estimated that in 1931, out of every 1,000 farms in the 10 principal cotton-producing States, 29 were sold through tax delinquency, mortgage foreclosures, bankruptcy action, or other involuntary causes. This compared with 19 involuntary farm sales out of every 1,000 farms in 1929, a year of relatively high cotton prices and farm incomes.

One of the most serious results of the present situation is the reduced standard of living on many cotton farms. The decreased purchasing power of cotton has been offset to some extent by increased production of food on farms, but it has been necessary to reduce expenses in other directions, including the medical, dental, and other services which make for the well-being of the individual.

Cotton Belt farmers have been forced to make additional adjustments that would permit them to live with the low cotton prices of 1930, 1931, and 1932. In doing this it was necessary to make changes in both the organization and the operation of farms. There were limitations to the widespread production of many crops other than cotton, however, because of limited local markets and the inability in many cases to compete in the central markets with the production of other areas.

Probably the most important change in farm organization was in the direction of providing more food and feed for use in the home and on the farm, because the prices of purchased goods have not declined so rapidly as cotton prices. The extent of the movement is indicated in a comparison of the organizations of similar-sized farms in the high plains cotton area of Texas in 1924 and in 1931. Cotton remained the chief source of income but more livestock were kept during the latter year, and sufficient feed was produced for their use. In addition, irrigated home gardens furnished an abundance of vegetables. On a group of 141 farms in the area, it was estimated that the value of the food produced and consumed at home in 1931 averaged $267 per farm. The degree to which farmers are "living at home" is particularly significant because the area has had a predominantly commercialized agriculture.

The other and more drastic adjustment made to meet the present situation was in the direction of curtailing the outlay of cash in operating the farm business. Purchases of farm machinery in 1931 were reduced and farmers themselves did much repairing of machinery. Fertilizer consumption in eight important cotton-producing States was reduced by approximately 58 per cent in 1932 as compared with 1929.

For the United States as a whole, preliminary estimates indicate that feed sales in 1931 were reduced approximately 37 per cent as compared with 1930. For the Cotton Belt States, it is probable that the reduction was even greater because of the increased attention given to the production of feed crops. Expenditures for hired labor were also drastically reduced, partly through lower wages but primarily through less intensive operation and a greater use of family labor. The sales of building materials for new farm improvements and repairs were severely curtailed during 1931. Of 688 farmers reporting on this item in 1931, only 88 incurred expenses for improvements and the expense reported was about 30 per cent lower than the average reported by farmers in 1929.

Farmers in the Cotton Belt are living in spite of low cotton prices, but it is doubtful how long a program of such drastic retrenchment can be maintained in certain directions. Expenses for needed improvements and for replacing farm machinery and work stock can not be postponed indefinitely. Climatic conditions will not always assure large yields despite decreased use of labor and fertilizer. Farm families will continue to live under reduced standards so long as no better opportunities are available in other occupations, but inadequate medical attention and educational advantages, if continued, will be decidedly injurious.

LAWRENCE MYERS, L. D. HOWELL, *and* B. H. THIBODEAUX,
Bureau of Agricultural Economics.

MULTIPLICITY of Varieties Handicaps Improvement in the American Cotton Crop For many years the United States Department of Agriculture has kept a record of the names of cotton varieties cultivated in the United States. More than 1,200 different names have been listed, about 400 of which have been added in the last 10 years. From one State alone about 150 variety names have been reported.

Many of these varieties are renamed older varieties, with no separate characters sufficiently distinct to justify different names. Comparatively few varieties now being cultivated in the United States have been subjected to any selection or improvement that could properly be called breeding. Practically every cotton farmer who succeeds in making a high yield, even though it be from a small area of especially good or highly fertilized soil, has a demand for seed for planting purposes. If this demand continues for several seasons the grower often gives the cotton a name, usually his own, and advertises it as a new variety. This has resulted in an almost endless confusion of variety names, most of them meaning little or nothing and representing no higher standard of purity of seed or quality of fiber than that which can be produced from ordinary run-of-the-gin seed.

Superior Varieties Available

During recent years superior high-yielding varieties of upland cotton producing a staple from 15/16 to 1¼ inches and longer have been bred and developed by the United States Department of Agriculture, by the State agricultural colleges and experiment stations, and by competent private breeders. These varieties are adapted to the entire range of climatic and seasonal conditions in the cotton-growing regions of the United States, from Virginia to California, and have been awaiting necessary improvement in the cotton industry to bring them into more popular demand and wider utilization.

For many years a vigorous campaign has been conducted by Federal, State, and responsible private organizations to encourage the wider planting of these superior varieties, in order to improve the average quality of the fiber produced. Encouraging progress has been made in the last few years, but the fact still remains that only about 5 per cent of the approximately 600,000 tons of seed required to plant the American crop is being handled by breeders and seed dealers, the remaining 95 per cent being largely of ordinary mixed gin-run stocks, producing a large proportion of short, irregular fiber with poor spinning quality.

In 14 cotton-growing States in the main Cotton Belt, State institutions are recommending approximately 100 varieties or strains of cotton for the various conditions of production. Of this total, about 50 may represent different varieties or strains, and only a few of these can be considered as distinct types.

Available information indicates that with intelligent application of known methods of breeding and selection not more than a dozen varieties of cotton are needed in the United States. With well-established regular supplies of locally adjusted pure seed available and generally planted under approved methods, it is believed that the present cotton crop could be produced on half the present acreage, and the quality of the crop would be greatly superior to that of the cotton now being grown.

It is the consensus of opinion that the most important single factor that has interferred with more rapid progress in popularizing the superior varieties has been the system of buying cotton from the growers in the local markets on a basis of quantity with little or no discrimination in quality of fiber. With no inducement to plant varieties producing better fiber, for which under present conditions he would receive no better price, the grower has confined his interest largely to varieties with high lint percentage or "turn-out" at the gin, in the belief that such varieties are more profitable under present conditions.

Seed Certification

Until recent years the farmer who wanted to purchase cotton planting seed was obliged to depend on the claims of dealers that the seed was pure and "true to variety." With no means of being assured in advance that the seed was as represented, only a few disappointments were needed to discourage the grower and induce him to return to the use of run-of-the-gin seed from the local ginner who handled his crop.

Through the efforts of Federal and State institutions and local associations, several of the cotton States have established practical measures for certifying the quality of cotton planting seed, based upon trueness to type and sufficient isolation, as shown by field inspections, approved methods of handling and ginning the seed cotton, and handling, storing, recleaning, and testing the seed. State certification of planting seed assures the grower of the quality of his purchase, and at the same time protects qualified breeders and dealers from unscrupulous dealers selling mixed, inferior gin-run seed as pure and true to variety.

Variety Registration

Several years ago, at a meeting of the Southern Agricultural Workers, an organization of leaders in cotton improvement in the South, a committee was appointed to consider the official registration of cotton varieties in the United States. It was hoped to establish a plan of control requiring that all breeders or dealers submit seed of new varieties or strains to be thoroughly tested by responsible and qualified experts, who would determine whether the improvements claimed by the breeder justified a new name.

If, through the State institutions, a practical plan of application can be worked out that will command the interest and support of breeders, growers, and agricultural leaders in the South, variety registration should lessen the tendency to give new names to strains that do not deserve varietal recognition. At the same time it would encourage competent and responsible breeders to confine their efforts to improving existing standard varieties, thus leading to the much-needed stabilization of varieties.

Characters of a Superior Variety

From the standpoint of the cotton grower, the characters of a superior variety of cotton are early maturity; medium to light foliage; large, storm-proof bolls, many with five locks and easy to pick; large yield per acre; high lint percentage; and abundance of fiber of good length, strength, and uniformity, on large heavy seeds that germinate well. (Fig. 5.) A tendency to continue fruiting at the top of the plants after a good crop of bolls has been set on the lower branches is a desirable character, because the younger top growth attracts the weevils from the lower bolls and in favorable seasons of late frosts larger yields can be obtained from such plants.

Small-bolled varieties may begin blooming and setting fruit a few days earlier than the big-bolled cottons, but early varieties with big bolls that frequently set more fruit during the first 40 days of the fruiting period than the small-boll cottons, have been developed. This is important, as the weevils are less numerous in the early part of the

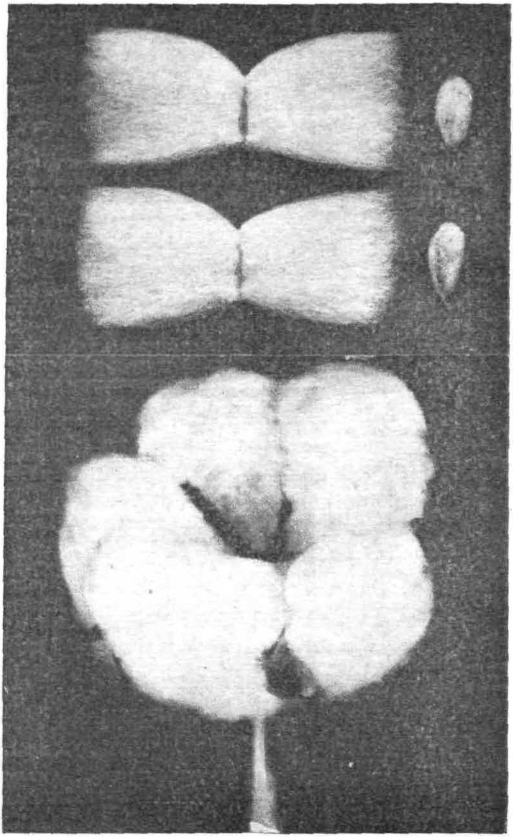


FIGURE 5.—A superior variety of cotton with a large, storm-proof boll, uniform staple, and large seeds. (Natural size)

season. Also, big-bolled varieties usually continue fruiting over a longer period than do the small-bolled cottons, which is also an advantage, because the weevils are attracted away from the growing bolls to the tender squares.

Most cotton varieties with small bolls appear in the field to be more productive than varieties with large bolls. This is due largely to the fact that most of the small-bolled varieties have short fiber. The bolls frequently open more widely and allow the cotton to fluff out from the locks. On account of their thinner walls, the small bolls dry out more quickly and usually open several days sooner than the thicker-walled bolls of the big-bolled varieties, though the latter will become immune to boll-weevil punctures sooner than the small bolls.

The increased planting of small-bolled varieties after the invasion of the boll weevil was largely the result of the popular idea that such varieties offered the best prospect of profitable production under weevil conditions. But there is ample evidence to show that equal or larger yields can be obtained from well-selected big-bolled varieties under most of the conditions that prevail in the Cotton Belt. Along the northern rim of the belt, where the seasons are shorter, better average results may be expected from varieties with somewhat smaller bolls. Also, in the more humid districts, difficulties may be encountered in wet seasons with varieties having very large bolls requiring a longer period to dry out and open.

From a practical standpoint an important economic advantage for the big-bolled varieties comes in the harvest season. Since it requires about the same length of time to pick 100 small bolls as it does to pick 100 large bolls, and since the latter weigh from 25 to 50 per cent more than the former, pickers can gather the big-bolled crop much more quickly and cleanly, thus obtaining higher average grades at less cost.

The popular belief that a higher precentage of lint proves the superiority of a variety has cost American cotton growers many millions of dollars annually and has led to further deterioration of varieties, rather than to improvement. High lint percentages give no assurance of larger yields per acre, but may be the result of smaller or lighter seeds and may characterize weak or unproductive varieties.

The custom of evaluating a variety of cotton by percentage of lint should not give the farmer the idea that the lint percentage is a true standard for judging varieties for planting. The practical question of how to produce the most fiber per acre has no relation to the percentage of lint obtained from a wagonload of seed cotton at the gin.

The farmer must consider the lint percentage in relation to other questions of practical importance such as the size and weight of the seeds, the earliness and yield of the variety, and the length and quality of the fiber. It is only when these other qualities are maintained that higher lint percentages can be accepted as evidence of superiority in a variety or specially selected strain.

The safest and most effective way to judge the merits of a cotton variety is to know, in addition to the lint percentage, the lint index, which is the amount of fiber on 100 seeds. An increase in the weight of the fiber on 100 seeds is associated with an increase in the weight of the seeds, and fewer bolls of such cotton are required to produce a pound of fiber. Thus the lint index is an important factor in the cost of production, because any increase in the weight of fiber from 100 seeds without change in the percentage of lint reduces the labor of

picking and thereby increases the efficiency of the pickers. Varieties with high lint percentage should not be selected unless they have the other desirable qualities.

Uniformity in length is one of the important factors in the spinning quality of cotton fibers. The ideal cotton, therefore, from the standpoint of the spinners and manufacturers, would probably have all the fibers of one length. But, unfortunately, uniformity in cotton fiber is only a relative term, since the natural condition is that the fibers on

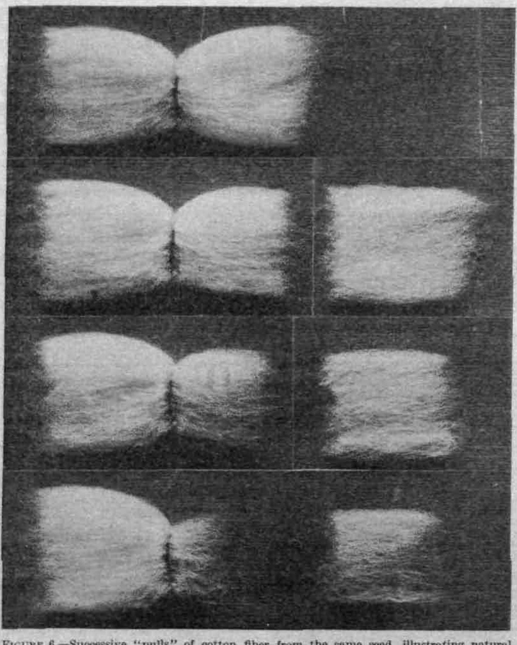


FIGURE 6.—Successive "pulls" of cotton fiber from the same seed, illustrating natural development of fibers of different lengths. (Natural size)

the seeds differ greatly in length. For example, in a variety with 1⅛-inch staple, each seed will have fibers ranging in length from the short fuzz immediately covering the seed, through the successive lengths called linters and substaple, to the commercial staple length, and commonly up to 1⅝ inches or longer. (Fig. 6.) While this range of fiber length on the individual seed has been known to cotton breeders for a long time, the importance of taking this natural condition of fiber development into account in breeding and selection has not been fully appreciated until recent years.

Since it is not to be expected that complete uniformity of fiber length can be attained in any variety through breeding, one of the problems of the breeder will be to develop a variety with the highest possible percentage of the fibers falling within a narrow range of length. That varieties do differ in the percentages of fibers of different lengths on the seed, and that the fiber of some varieties remains more uniform under variable conditions of production, have been indicated.

Much remains to be learned about the relation of spinning quality to fineness, spirality or natural twist, maturity, and physical structure of the fibers. These and other related characters are being intensively studied by breeders and fiber technologists in the Department of Agriculture and in State institutions, as well as by cotton spinners and *manufacturers*.

Cluster Varieties

Many so-called "cluster cottons" with very short-jointed fruiting branches have been advertised and sold as very productive new varieties. The cluster cottons usually appear very fruitful in the fields because the white cotton shows in large masses where the bolls are crowded together, and sometimes large crops are produced under favorable conditions. In the extreme cluster forms, several bolls may be fused or grown together into what appears to be a single boll with as many as 12 or 14 locks.

A detailed study has shown the cluster habit of growth to be a result of abnormalities in the formation of the branches, which explains the tendency toward sterility. Since this apparently is a general feature of the cluster cottons, it is possible to overestimate the value of the extremely close-jointed type of plant.

None of the cluster cottons has attained more than temporary popularity, as the yields usually are very irregular, and many of the plants may be entirely sterile when the seasonal or other conditions are unfavorable. Other objectionable characters are irregularity in fiber length, excessive shedding under unfavorable conditions, and the difficulty in picking, of keeping trash out of the lint where it causes lower grades. In addition, many of the pedicels or flower stems have imperfect joints at the bases, which prevent the buds and bolls that ordinarily would be shed from being detached and falling to the ground. This is very undesirable under weevil conditions, since the natural control of the weevil depends largely on the larvæ being killed in the fallen squares by the heat of the sun.

Novelty Varieties

The Department of Agriculture receives many inquiries regarding the possibilities of producing in the United States special types or varieties of cotton as novelties for which high prices would be expected from manufacturers. Two of these varieties that have attracted the most interest in recent years are one producing colored fiber and a type called "wool" cotton with short, wiry fiber.

A variety of cotton with greenish lint, sometimes called "Texas Wool," has many times been brought to the attention of the department by farmers interested in its possible commercial value. While the greenish lint is the natural color of the fiber, it does not represent a recognized or desirable variety, but a chance variation that appears occasionally in fields of white cotton, like red ears in fields of corn.

The fibers are weak and irregular like the short fuzz of the seed, which in some varieties has a greenish color. It has been reported that a few bales of this fiber have been raised by farmers who hoped that such a novelty would prove valuable, but could find no market for it.

Many varieties of cotton producing colored fiber are found in tropical America as well as in the Old World, but the fiber is chiefly used for homespuns in the countries in which it grows and is not exported. The range of color is from light buff to a rather deep rusty brown. Several of the brownish-linted cottons of tropical America resemble the upland cotton grown in the United States, but many belong to the tree-cotton group, which probably could be separated botanically into several species. Samples of cotton cloth made from brown lint have been taken from Indian graves of great antiquity in Peru and other tropical American countries.

In view of the modern development of the art of dyeing, the importance of naturally colored fiber is easily overestimated. The colored fiber would need to have some other desirable characteristics to justify its industrial use, whereas most of the colored variations are distinctly inferior to the white fiber of the same type.

The attention of the department has many times been called to a variety of cotton with short, coarse, wiry fiber, known as "Garo Hill," or in some localities as "wool" cotton. This cotton came originally from the Garo Hills of northeastern India. Small quantities of rough Asiatic cotton similar to the Garo Hill have been imported and used in the United States in the manufacture of blankets, usually at prices somewhat below those of American upland cotton.

The possibility of producing such cotton in the United States has received attention at the request of manufacturers, but in most cases it has been difficult to get a stand, yields have been low, and the crop is subject to severe damage in stormy weather. It is also difficult to gin the wool cotton on the regular saw gins, on account of the small size of the seeds, but ways of overcoming this difficulty probably could be found if the crop were satisfactory in other respects.

In plantings made several years ago in Florida, Texas, and South Carolina, after a severe rain and windstorm most of the crop had fallen out upon the ground. This tendency of the fiber to fall out of the bolls if not picked promptly renders this cotton poorly adapted to cultivation in the United States. In China the pickers are kept continuously in the fields and the cotton is gathered soon after the bolls open.

On the basis of the results of many years of experimentation by Federal, State, and private investigators, the best advice to American cotton farmers is to leave the novelty cottons alone, and devote their time and energies to the cooperative production of standard, improved varieties that experience has shown offer the best long-time prospects of profitable production.

C. B. Doyle, *Bureau of Plant Industry.*

LIVE-AT-HOME Plans and Soil Building Aid Cotton Growers Much of the distress among cotton producers in the United States during periods of low prices has been the result of the almost complete lack of any constructive plan for maintaining soil fertility on the cotton farms and of the failure to produce food and feed crops to complete a sound "live-at-home"

farm program. It has been the common practice of growers to plant the same land to cotton year after year with practically no attention to the proper use of fertilizers or to rotation of cotton with soil-building crops. Growers in the eastern section of the Cotton Belt have depended largely on homemade or commercial fertilizers applied too thinly to provide sufficient plant food to maintain even fair yields of cotton. This soil starvation has resulted in gradual loss of fertility with lower yields of shorter and more irregular fiber of inferior quality.

On the other hand, those cotton growers who so plan their cropping systems as to provide first for sufficient acreages of corn, small grains, hay, and other feed crops (including cowpeas, peanuts, soybeans, velvetbeans, and similar crops), not only to feed pigs, chickens, farm work stock, and family cows, but also to build up and maintain soil fertility, are able to produce cotton at low cost, and get the best returns for the land used and for the capital and labor expended. These farmers usually plan for as many acres of cotton as they can care for properly and harvest early with the available farm equipment and such assistance as may be relied upon.

After providing for farm needs, including fertility, and for such acreage of cotton as can be well cared for, other enterprises may be selected in order to make use of unutilized land and labor. Such enterprises may increase food and feed for sale or for some productive livestock enterprise, but care must be taken that these added enterprises do not seriously compete with cotton in labor requirements or tend to diminish the fertility of the soil.

The choice of crops and groupings will differ according to local conditions, and farmers should consult their State experiment stations or *extension services for specific advice on their own particular problems.*

As a result of an intensive study made several years ago, the following general recommendations for improvements in farm practices with cotton are being emphasized by the United States Department of Agriculture and the Association of Southern Agricultural Workers.

Selection of Land

Select well-drained, fertile soil for cotton. Only land capable of producing at least one-half bale per acre with the use of a reasonable quantity of fertilizer, should be planted to cotton, if such land is available.

Preparation of Soil

No set rules for preparation of the seed bed can be laid down. This operation will be influenced by the topography type of soil, the crop previously grown, seasonal conditions, and available implements. Flat breaking in fall or early winter is desirable, especially on heavy soils not subject to washing, and where the land has for some time been planted continuously in cotton. Five or six inches is sufficiently deep to break land for cotton. On lighter soils, bedding in rows of the desired width some time before planting seems to answer every requirement. Preparation should be early enough to give a firm, smooth, well-settled seed bed at planting time.

Fertilizers

The use of commercial fertilizers in arid regions having scant summer rainfall, can not safely be recommended, but elsewhere it has generally proved profitable in the production of cotton. Applications up

to 800 pounds per acre, according to soil type and natural fertility, are recommended generally by the experiment stations of practically all the States in humid territory. The fomulas now most used for cotton fertilizers are variations of 3–8–3 or 4–8–4, the figures representing respectively the percentages of available nitrogen, phosphoric acid, and potash. In very sandy soils or where rust is present a potash content higher than in clay loam soils or sandy loams with a friable red clay subsoil, is ordinarily needed. In the latter soils the use of phosphoric acid and nitrogen alone frequently gives satisfactory results. Fertilizers are applied to best advantage just before or at planting time. An additional application of 100 to 200 pounds of nitrate of soda or other form of quickly available nitrogen as a side dressing is now generally recommended. This is usually made immediately after cotton has been chopped and hoed. In the Delta soils of Mississippi and in similar types, nitrogen in a quickly available form is the only fertilizer commonly used. (See article on fertilizers for cotton soils, p. 118.)

Planting

Selected seed of an improved, early maturing variety, recommended for the locality by the State experiment station and the United States Department of Agriculture, should be planted.

Planting should not be done until it is reasonably certain that danger from frost and cold is past and the ground has become warm enough to insure prompt germination and vigorous early growth. Heavy seeding and proper depth of planting are very necessary to insure a full stand. Not less than 1 bushel, and preferably 1½ bushels, of seed per acre should be planted, unless a "dropper" planter is used, when 2 to 3 pecks is sufficient.

Graded and delinted seed, under favorable weather conditions, will germinate sooner and produce healthier, more uniform, and more vigorously growing plants than ungraded and untreated seed. The planting of a single variety as nearly simultaneously as possible by entire communities and counties is strongly urged.

Spacing

Rows should be 3 to 4 feet apart, depending on the fertility of the soil. Rank growth may be prevented by leaving the plants closer together in the rows than was customary in former years. Early maturity and larger yields are generally obtained by leaving two or three stalks together in hills a hoe width apart. The spacing recommendation of the Association of Southern Agricultural Workers is 8 to 12 inches with one to three stalks in the hill, dependent on soil and average seasonal conditions.

With the larger yields that can be obtained under the close or "thick" spacing method, it is possible to restrict the planting of cotton to the better soils, so that fewer acres can be made to produce the same quantity at less cost per pound. This would leave marginal areas, now producing low yields of inferior fiber, for other crops to which the land is better suited, thus avoiding the wide fluctuations in yields now being obtained under the unscientific methods of production generally applied.

Cultivation

Cultivation should be shallow and frequent enough to keep the crop free from weeds and grass. If the cotton ridges are not too high, a cultivation with the weeder or section harrow before the cotton comes up, and one or two cultivations of the same kind immediately after the cotton is up, are effective in killing weeds and grass, preventing a crust from forming, and starting young cotton to growing vigorously. During severe boll-weevil infestations it is advantageous to continue cultivation two or three weeks beyond the usual "laying-by" time. Great care must be taken, however, as careless or deep cultivation, particularly at this time, may cause the plants to shed much of their fruit.

Weevil Control

If boll weevils are numerous at the time cotton is just beginning to square, all adult weevils should be destroyed, either by hand picking or by poisoning, as may be most practicable. At this stage the molasses and calcium-arsenate mixture applied with a mop, can be used effectively instead of dust, if more convenient. When squaring begins, especially if the grower is not equipped to poison by dusting, he should pick and destroy all punctured squares from the ground and the stalks once every week to 10 days for about 30 days. Then, if weevils are still numerous or if as many as 10 to 15 per cent of squares are infested and other conditions warrant, he should apply the calcium-arsenate dry-dust poison. In applying the dust poison directions of the United States Department of Agriculture and the State college of agriculture should be followed carefully. (See article on protection agaiust cotton insects, p. 126.)

Picking and Ginning

Cotton should be picked when dry, picked clean, and kept dry until ginned. If not thoroughly dry when ginned the staple is cut and damaged, and the price is sometimes reduced several cents a pound. The same thing will happen if the gin saws are out of alignment, if the saws are bent so that some of them drag or rub against the ribs, if some of the teeth are dull or broken, or if the saws are revolving at an improper or too great speed with high rate of feed and tight seed-roll density. More care is required to gin the upland long staples without injury to the fiber than to gin the short-staple varieties.

A comprehensive study of cotton ginning to determine the nature and extent of gin damage to the fibers was begun by the department in 1930 at Stoneville, Miss., where a specially equipped experimental cotton-gin plant and laboratory has been erected on a site made available by the Mississippi Delta Branch Experiment Station. Through the efforts of agricultural engineers, fiber analysts, and agronomists, the department is obtaining much information on the fundamental principles of cotton ginning and cleaning, which should increase the understanding of the relationships between the properties and conditions of the seed cotton, the mechanical conditions of the ginning machinery, and the resulting quality of the ginned lint.

A recent development of this investigation is the devising of a simple and inexpensive attachment for drying the seed cotton before ginning,

which greatly improves the condition of the cotton and facilitates the ginning operation. With the general application of the improvements that are possible in the mechanical adjustment and operation of the ginning machinery, the present enormous losses through poor ginning and consequent damage to quality and utility of the fiber should be largely avoided.

C. B. DOYLE, *Bureau of Plant Industry.*

FERTILIZER Composition and Placement Play Big Part in Cotton Growing In the production of cotton some 2,000,000 tons of commercial fertilizers are utilized annually in the United States. These fertilizers are especially important in cotton production in the Southeastern States, where about 95 per cent of the cotton acreage receives commercial fertilizers. Approximately one-third of all the fertilizer consumed in the United States is used in cotton production. In the south-central cotton-producing States only about 50 per cent of the acreage receives fertilizers, and in the southwestern belt only a small amount of commercial fertilizer is used in growing cotton, and this is confined to a relatively small acreage.

Composition of Fertilizers

The composition of fertilizers best suited for cotton growing differs with soil and climatic conditions. In the Southeastern States most soils used for cotton require, for normal growth and development, a complete fertilizer containing a well-balanced proportion of nitrogen, phosphoric acid, and potash, the analysis and fertilizer material depending in a large measure on the type of soil.

On the gray sandy loam soils of the coastal plain, occuring in the extreme northeastern section of the Cotton Belt including southeastern Virginia and northeastern North Carolina, which normally produce a rank vegetative growth, making early maturity an essential factor, a mixture containing 4 per cent of nitrogen, 12 per cent of phosphoric acid, and 4 to 6 per cent of potash is suitable. On the lighter soil types in this area, on which vegetative growth is inclined to be less vigorous, a mixture containing 6 per cent of nitrogen, 10 per cent of phosphoric acid, and 4 to 6 per cent of potash usually gives the best results.

For the heavy clay loam and sandy loam soils of the central coastal plain section, including eastern North Carolina and eastern South Carolina, which normally produce rank vegetative growth, making early maturity essential, a mixture containing 4 per cent of nitrogen, 10 per cent of phosphoric acid, and 4 per cent of potash is suitable. On the lighter sandy and sandy loam soils of the area a mixture containing 4 to 5 per cent of nitrogen, 8 per cent of phosphoric acid, and 3 to 4 per cent of potash may be used with better results in order to stimulate vegetative growth. On the lighter sandy soils of this area the application of materials containing 18 to 30 pounds of nitrogen per acre in readily available form has proved profitable when made after the cotton is up, in addition to the complete fertilizers applied at planting.

For the clays and clay loams of the piedmont section of North Carolina, South Carolina, Georgia, and Alabama, a mixture containing 4 to 5 per cent of nitrogen, 10 per cent of phosphoric acid, and 2 to 3 per

cent of potash has given good results. The sandier soils of this section may do better with mixtures containing 4 to 5 per cent of potash. On its less fertile soils it is considered good practice to use from 18 to 30 pounds of nitrogen per acre, from readily available materials, after the cotton is up, in addition to the preplanting application.

On the coastal plain soils of Georgia, particularly the heavy, dark, pebbly soils of the Tifton series, a mixture containing 3 per cent of nitrogen, 9 per cent of phosphoric acid, and 5 per cent of potash is recommended. A mixture containing 3 per cent of nitrogen, 9 per cent of phosphoric acid, and 8 per cent of potash may be better for the sandier and lighter phase of this soil. The gravelly, sandy soils of the Norfolk series respond well to a mixture containing 4 per cent of nitrogen, 8 per cent of phosphoric acid, and 4 per cent of potash; and for the red and brown soils of the Greenville and Orangeburg series a mixture containing 4 per cent of nitrogen, 10 per cent of phosphoric acid, and 4 per cent of potash seems most effective. On the light, porous, sandy soils of this section from 18 to 20 pounds of readily available nitrogen per acre can be used at the first cultivation of cotton after chopping, in addition to the usual application of complete fertilizer before planting.

For the hill and flatwoods soils of Mississippi a fertilizer containing 4 to 6 per cent of nitrogen, 8 per cent of phosphoric acid, and 4 per cent of potash is suitable; for the prairie section the mixture may contain 8 per cent of nitrogen and 8 per cent of phosphoric acid, except on soils subject to cotton rust, where an 8–8–4 mixture is recommended. Where it is desired to use a higher-analysis fertilizer, multiples of the foregoing ratios should be used.

For the Mississippi Delta and other bottom soils near streams in the central Cotton Belt, from 25 to 30 pounds per acre of nitrogen alone has generally been used with success, and on the soils subject to cotton rust 25 pounds per acre of potash in addition to the nitrogen may be profitable.

The fertilizer requirements of the soils used for cotton in western Louisiana and eastern Texas are somewhat similar to those of the more eastern soils of the central Cotton Belt. Little fertilizer is used in the southwestern Cotton Belt, which may be designated as that area having its eastern edge at the dividing line between the great black-prairie region and the timbered section of the East. It includes three-fourths of the States of Texas and Oklahoma and all of New Mexico and Arizona.

In the black-prairie region where there is considerable loss of cotton from root rot, response from applications of quickly available nitrogen fertilizers or mixtures of phosphate and quickly available nitrogen has been noted in recent experiments. This response is shown primarily in the rapid growth produced, and the early fruiting of the plant and maturing of the cotton, that result in a considerable increase in yield at the earlier pickings. The earlier maturing of cotton on these black-prairie soils, brought about by the addition of quickly available nitrogen and phosphoric acid, is a means of preventing losses from killing of plants by root rot later in the season. The rational use of fertilizers and a practice of modified tillage, in conjunction with crop rotation, soil conservation, and other measures of maintaining or restoring fertility, offers promise for directly or indirectly controlling cotton root rot in the black-land region of Texas.

Fertilizer Materials

Nitrogen is probably the most important fertilizer constituent in growing cotton on most soils. It is required for vigorous growth in the early part of the season. The principal inorganic-nitrogen sources used in cotton fertilizers are sodium nitrate and ammonium sulphate, and the principal organic sources are cottonseed meal, tankage, fish scrap, and dried blood. The synthetic-nitrogen materials, such as urea and a combination of this with other salts, are suitable for cotton fertilizers. A mixture of inorganic or synthetic nitrogen salts with organic nitrogen of vegetable and animal-waste origin is considered best for most cotton soils, when used with phosphoric acid and potash in preplanting applications.

Phosphoric acid is essential for the cotton plant at all stages of growth, but its principal and most important rôle is in maturing the cotton. Superphosphate is the principal source of phosphoric acid in commercial fertilizers. Grades containing from 16 to 48 per cent of phosphoric acid are available. Ammonium phosphate, produced by combining air-derived nitrogen and phosphoric acid, is available for cotton fertilizers.

Potash is essential for the normal development of the cotton plant and for the proper maturing and opening of the bolls. The principal sources of potash in fertilizers for cotton are potassium chloride, potassium sulphate, manure salts, and kainit. The first two contain approximately 50 per cent of potash, manure salts contains from 20 to 30 per cent of potash, and kainit from 12 to 16 per cent of potash.

Quantities of Fertilizers

The most profitable quantity of fertilizer per acre for cotton varies with soil conditions, farm management, and economic conditions. The largest acreage applications are in the Southeastern States. Experiments on soils east of the Mississippi River show that from 600 to 800 pounds of well-balanced commercial fertilizers per acre have generally proved the most profitable. On many of the heavier overflow soils of this belt, best results may be obtained by adding quickly available nitrogen salts alone at the rate of 18 to 20 pounds of nitrogen per acre, applied after the cotton is up. In that section of the Cotton Belt west of the Mississippi River where commercial fertilizers have proved profitable, from 300 to 500 pounds of commercial fertilizers have generally given as good results as larger quantities.

Placement of Fertilizers

Cottonseed should not be planted in contact with fertilizers. It is common practice in much of the Cotton Belt to apply the fertilizers in an open furrow, mix them with the soil, cover them, and allow the seed bed to settle for 8 to 10 days before planting the seed. By this procedure the seed is planted above the fertilizer, on settled ground, which practice has generally proved satisfactory. Combination planters and fertilizer distributors, which apply fertilizers and plant the seed simultaneously, have recently been introduced. Data made available by experiments with machine application of fertilizers to cotton indicate that to obtain the most rapid coming up of cotton plants, the best stands and the largest yields, the fertilizer placement is in bands about 2 inches

to each side of the seeds and about 2 inches below the level of the seeds. Placement of fertilizers in relation to the seed is an important factor in cotton growing, especially with fertilizer containing quickly soluble salts.

In growing cotton, serious consideration should be given to the selection and fertilization of the land. High acreage yields tend to lower the cost of cotton production, and the use of proper fertilizers should be helpful.

J. J. Skinner, *Bureau of Chemistry and Soils.*

COTTON Diseases Take Two Million Bales of U. S. Crop Annually Cotton is attacked by many fungous, bacterial, and physiological diseases which cause annual losses of more than 2,000,000 bales to the cotton crop of the United States. Twenty-eight specific diseases in various sections of the Cotton Belt have been reported by pathologists and mycologists during the last 20 years. The major diseases affecting cotton in the order of their importance, are root rot, Fusarium wilt, bacterial blight (in its various phases), root knot, rust, anthracnose, and Verticillium wilt.

Root Rot

Root rot, caused by the fungus *Phymatotrichum omnivorum,* is the most important cotton disease in the southwestern States. The greatest damage occurs in Texas, especially in the heavy black-waxy soils. In this State the disease attacks cotton in 196 counties and, it is estimated, causes an annual loss of 12 to 15 per cent of the crop; total losses to the State are estimated at $100,000,000 annually. Root rot is also responsible for serious losses in parts of Arkansas, Oklahoma, New Mexico, Arizona, southern California, and in northern Mexico. Observations over a period of years show that the root-rot fungus is native to this region, as it is often found on wild plants remote from cultivation and frequently attacks cotton, alfalfa, and other susceptible plants when virgin land is cleared and planted to these crops. More than 600 cultivated and wild plant species are known to be susceptible to it.

By attacking and destroying the root system, the fungus causes sudden wilting and death of the plants, its growth in the soil being entirely subterranean except when it is producing fruiting bodies. During warm periods following rainy weather in midsummer and later, the disease is very active, often completely killing out large areas of cotton.

In contrast with the ordinary means of dissemination of other fungous and bacterial diseases of cotton, there is no evidence that root rot is spread by such agencies as farm implements, animals, wind, or water from infested fields, but may be carried to new localities through the transfer of infected plants or of sclerotia. The root-rot spots in cotton or alfalfa fields usually persist in the same areas for several years, and enlarge each year by a new belt of growth, where the disease often is more destructive than in the area previously occupied. In cotton fields the spots may dissappear for a season or longer and then reappear as small centers of infection which begin to expand with renewed vigor.

Studies of the fungus have shown that three stages of development occur in its life history. These are: (1) The vegetative or Ozonium

stage, which spreads through the soil and attacks the roots during the growing season; (2) the sclerotial or resting stage, one of the principal means of persisting and overwintering in the soil (fig. 7); and (3) the conidial stage, which frequently occurs aboveground under special conditions of shade and moisture, but whose function is yet unknown. Attempts to germinate the spores that are abundant in the conidial mats have met with failure, and there is no evidence that they cause infection.

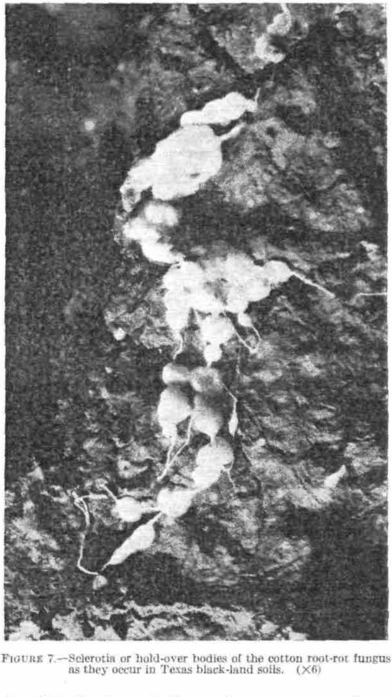


FIGURE 7.—Sclerotia or hold-over bodies of the cotton root-rot fungus as they occur in Texas black-land soils. (×6)

No satisfactory way of dealing with the root-rot disease has been found, but significant information on the habits of the fungus and its mode of progression through the soil has been obtained in recent years, so control measures may eventually be developed.

In Texas, where the disease is particularly serious, a 2-year and preferably a 3-year rotation of cotton with grain crops, combined with deep tillage immediately after the grains are harvested, has reduced the disease in some experiments. Recent experiments in treating primary centers and small spots of infection with 4 per cent ammonia water are giving favorable indications of control. The toxic effect of ammonia on the root-rot fungus has been confirmed in many experiments, including the disinfection of diseased cotton roots by application of ammonia to the soil under field conditions. Other ammonium compounds have also reduced the infection in some tests. Under irrigation, applications of formaldehyde killed the vegetative and sclerotial stages of the fungus at considerable depths in the soil, and repeated applications of barnyard manure were also effective in reducing the extent of the disease.

Fusarium Wilt

Fusarium wilt, caused by the fungus *Fusarium vasinfectum*, is found in many types of soil, from Virginia to New Mexico. The losses from this disease are difficult to estimate, but in the aggregate they reach several million dollars annually.

Wilt-infected plants appear dwarfed somewhat early in the season, the leaves become yellow between the veins, and sections of stems and roots are black, giving rise to the common name "black rot." The fungus gains entrance into the roots of the plant from the soil, and its growth produces in the tissues toxins which finally accumulate in sufficient quantity to cause wilting and eventually death of the plant.

In attempting to control wilt, growers should bear in mind the following points: (1) If the disease is unusually prevalent, select wilt-resistant varieties of cotton; (2) combine this procedure with a system of crop rotation that is adaptable to the particular locality; (3) fertilize the plants liberally with high-grade, balanced fertilizers, and maintain adequate vegetable matter in the soil either by adding manure or by plowing under cover crops such as rye, vetch, cowpeas, or soybeans. Adequate plant food increases the resistance of the cotton plant to wilt and many other diseases. Wilt-resistant varieties adapted to local conditions have been developed in the wilt-infected regions, and farmers are advised to apply to their State experiment stations for information on suitable varieties and on sources of seed supply.

Bacterial Blight

Bacterial blight, also known as black arm and angular leaf spot, caused by the organism *Bacterium malvacearum* (*Phytomonas malvacearum*), occurs generally throughout the South and also in the southwestern cotton districts. It is estimated to cause an annual loss in upland cotton of about 2 per cent, while in the Egyptian and sea-island varieties its damage is sometimes much greater. The principal injurious effects are the stunting or death of seedlings, defoliation of the plants, the shedding of buds and the rotting of bolls. (Fig. 8.) Damage is often especially severe after windstorms and during cold, wet weather, and the disease is chiefly spread by wind-blown rain.

Experiments have shown that the disease is largely seed-borne and may be effectively controlled by seed treatment. The use of dust disinfectants containing from 1.4 to 1.6 per cent ethyl-mercury-chloride, and other organic-mercury compounds, have given satisfactory results in experimental seed treatment for blight control. Seed treated with these dusts at the rate of 4 ounces per bushel of seed has produced excellent stands of cotton with a minimum of blight infection on the seedlings.

Root Knot

Root knot is caused by minute eelworms or nematodes, *Caconema radicicola*, which bore into the roots, causing galls or abnormal swellings. This disease affects cotton and many other plants in practically every State in the Cotton Belt. Like wilt, it is most severe in sandy soils of low water-holding capacity. Losses to the crop range from a trace to as high as 4 per cent annually in some of the principal cotton-producing States.

The pest affects all susceptible crops alike, causing swellings, nodules, and discoloration of the roots, and stunting the growth of the plants by cutting off the food and water supply. Root knot is disseminated by drainage water, cultivating implements, infected plant roots, or by any agency that may carry soil particles. A common means of spread is through planting infected nursery stock.

In cotton districts where root knot is unusually prevalent, rotation with nonsusceptible crops such as winter grains or resistant summer

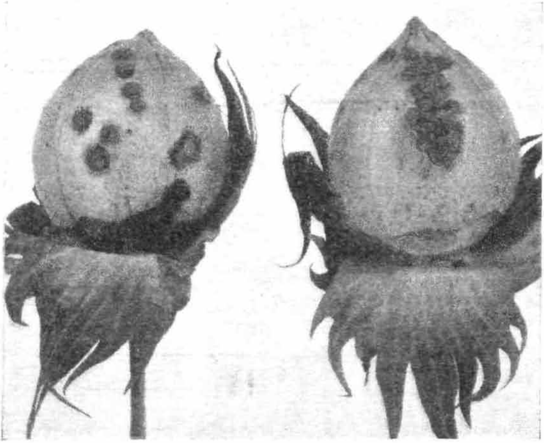


FIGURE 8.—Characteristic appearance of cotton bolls infected with bacterial blight. (Natural size)

legumes for two or three years in succession, is the only effective control measure so far developed. A list of cultivated plants that are resistant or susceptible to root knot may be obtained from the United States Department of Agriculture upon request.

Rust

Rust or "potash hunger" is a physiological disorder of the cotton plant, prevalent on soils of low fertility, especially those deficient in vegetable matter and available potash. It occurs commonly in the coastal plain districts of the Cotton Belt, and is also sometimes observed on poorly drained "buckshot" prairie and lime-land sections of States in the mid-South. The average annual loss for the entire Cotton Belt is estimated at about 4 or 5 per cent of the crop.

Plants affected with rust fail to make normal growth, being small and lacking a healthy green color. Toward the middle of the season the leaves assume a mottled appearance, yellow spots appearing over areas farthest removed from the veins. These spots enlarge and

become brownish, and later the entire leaf becomes somewhat blackened, curled, and ragged. Shedding follows rapidly, leaving the stalk bare. Since most of the leaves are shed prematurely, the bolls fail to develop properly and the lint is of inferior quality.

Rust may be satisfactorily controlled by increasing the vegetable content of the soil. This may be done by growing and plowing under green-manure crops, such as cowpeas, soybeans, Austrian winter peas, and vetch, or with liberal applications of barnyard manure. The use of kainit at the rate of 200 pounds per acre, or fertilizers containing from 4 to 6 per cent available potash, will also reduce rust damage.

Anthracnose

Anthracnose, or pink boll rot, caused by the fungus *Glomerella gossypii*, is widely prevalent throughout the mid-South and Southeastern States, especially where cotton grows rank and where rainfall is frequent. The losses from this disease range from less than 1 per cent to as high as 40 or 50 per cent in some localities. Although primarily a disease of the bolls, on which it produces spots with pinkish centers, it sometimes attacks the leaves, stems, and bracts. The lint from infected bolls is usually stained pink and in many instances may be entirely rotted and worthless.

Since the disease is disseminated largely through infected seed, and lives over the winter on diseased bolls and stalks left in the field, control may be accomplished by crop rotation and by using seed from areas having a minimum of infection.

Verticillium Wilt

Verticillium wilt, caused by the fungus *Verticillium alboatrum*, has recently been reported on cotton plants from the San Joaquin Valley of California and from several Delta counties in Arkansas, Mississippi, and Tennessee. It also occurs on cotton in Virginia. Although only a few observations have been made, Mississippi authorities report that "the heavier sedimentary and alluvial soils are more favorable to the disease than are the lighter, sandier types." The damage caused by this wilt in the areas where it attacks cotton is unknown, but observations in fields in several counties in Mississippi and Tennessee showed a range from only a trace of infection to as high as 40 per cent.

The symptoms of plants infected with Verticillium wilt and of those infected with Fusarium wilt are very similar, and some pathologists even state that the two diseases are indistinguishable except in laboratory cultures. The Verticillium wilt, however, appears to be less virulent under certain conditions, and frequently does not seriously affect the yields of seed cotton.

No definite control measures for the disease are known, and in tests conducted thus far in Mississippi and California no varieties of cotton have been found resistant. Therefore, pending further studies in the development of resistant selections, rotations with alfalfa, grains, or other nonsusceptible crops may be a practical means of avoiding serious damage.

D. C. NEAL, *Bureau of Plant Industry.*

163050°—33——9

CULTURE, Insecticides, and Quarantines Help Control Cotton Pests

From the beginning of cotton culture on this continent growers have had to contend with insect pests, and have always considered them as important factors limiting cotton production. One hundred years ago and earlier the losses were caused by the cotton leaf worm, the cotton bollworm, and the cotton louse or aphid. These insects are still as important as they ever were, but they have been somewhat overshadowed in recent years by the boll weevil, the cotton flea hopper, and the pink bollworm.

Figure 9 shows graphically the relative damage caused by the boll weevil and other cotton insects to the cotton crops from 1909 to 1931, inclusive, according to estimates made by the Bureau of Agricultural Economics. It will be noted that in only 2 years out of the past 23 did all other cotton insects combined cause more loss than did the boll weevil. In 1911 the cotton leaf worm made its appearance early and caused the defoliation of cotton over large areas. In 1926 the cotton flea hopper was unusually abundant in parts of Texas and other States.

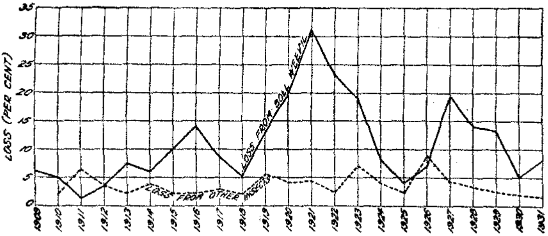


FIGURE 9.—Annual loss caused by the boll weevil, compared with that caused by other insects, 1909–1931. These figures were obtained from the 13 important cotton-growing States in which the boll weevil occurs—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia. There are only three other important cotton-growing States—Arizona, California, and New Mexico

It is difficult to make statements about cotton insects and their control that will apply to any large area. Cotton is produced commercially in all the Southern States, from Virginia to California. Each State has its cotton-insect problems, but no two have exactly the same problems. The problems in two adjoining counties may be very different, and even on adjacent farms there may be striking differences in the abundance of insect pests and in the damage that they cause. Each farm and each cotton field offers a separate problem. To combat the insects successfully the grower should be acquainted with the important species that occur on his farm. Only a few important cotton insects, such as the bollworm and the cotton aphid, occur throughout the entire Cotton Belt, and these vary greatly in abundance in different localities from year to year and even from month to month.

A brief summary of information on 12 injurious cotton insects, giving their origin, distribution in this country, nature of injury, and practical control measures, is given in Table 4.

TABLE 4.—*Condensed information on 12 important cotton insects in the United States*

Common name of insect	Scientific name of insect	Probable native home	Distribution in United States	Nature of injury	Crops other than cotton attacked	Control
Boll weevil	*Anthonomus grandis* Boh.	Mexico and Central America.	Texas, Oklahoma, and all cotton States east of them.	Causes shedding by feeding on squares and bolls. Grubs feed on seed and lint in green bolls.	None	Dust at 5-day intervals with calcium arsenate, when as many as 10 per cent of squares have become infested, using 5 to 7 pounds per acre. Destroy stalks early in fall. Practice good culture.
Bollworm	*Heliothis obsoleta* Fab.	Tropical and subtropical America.	General	Destroys squares and bolls by eating into them.	Corn, tomatoes, beans, etc.	Dust with calcium arsenate. Plow in fall and winter to destroy pupae in soil.
Cotton leaf worm	*Alabama argillacea* Hbn.	Mexico, Central America, and South America.	May appear at irregular intervals, anywhere in Cotton Belt through migration of the moths from countries south of the United States.	Defoliates plants	None	Dust with calcium arsenate or other arsenical posion.
Cotton flea hopper	*Psallus seriatus* Reut.	United States	General	Makes feeding punctures that cause small squares to shed.	do	Destroy goatweed, horsemint, and other weeds in winter. Dust with 10 pounds of finely ground sulphur per acre. *If boll weevils are abundant,* use 8 pounds of sulphur and 4 pounds of calcium arsenate per acre.
Tarnished plant bug.	*Lygus pratensis* L.	Europe	do	Makes feeding punctures that cause squares to shed.	Many	Dust with sulphur as for cotton flea hopper.
Cotton plant bug	*Adelphocoris rapidus* Say.	United States	do	Makes feeding punctures that cause squares and small bolls to shed.	do	Do.
Common red spider	*Tetranychus telarius* L.	Unknown	do	Sucks plant juices. Causes shedding of leaves.	do	Keep down weeds near cotton fields. Dust with finely ground sulphur, 10 pounds per acre.
Cotton aphid	*Aphis gossypii* Glov.	Northern Hemisphere.	do	Sucks plant juices, stunts plants, causes leaves to curl and fall. Gives off honeydew that injures fiber in open bolls.	Melons, squash, cucumbers, okra, etc.	Dust with 2.5 per cent of nicotine prepared by mixing 6¼ pounds (5 pints) of nicotine sulphate with 100 pounds of hydrated lime or with calcium arsenate if boll weevils are also to be controlled.
Corn root aphid	*Anuraphis maidiradicis* Forbes.	United States	As a cotton pest in North Carolina and South Carolina.	Sucks juices from roots, stunts and kills young plants.	Corn	Rotate crops so that cotton does not follow corn or cotton. Keep down weeds in vicinity. Plow deeply. Cultivate frequently.

TABLE 4.—*Condensed information on 12 important cotton insects in the United States*—Continued

Common name of insect	Scientific name of insect	Probable native home	Distribution in United States	Nature of injury	Crops other than cotton attacked	Control
Pink bollworm	*Pectinophora gossypiella* Saund.	India	Small areas in Arizona, New Mexico, Texas, and Florida.	Reduces quality and quantity of seed and lint by feeding of worm.	None	Quarantines protect uninfested areas. Sterilize seed by heating. Destroy gin trash. Pick cotton early and destroy stalks. Pasture fields after picking. Plow deeply and irrigate if practicable.
Cotton leaf perforator.	*Bucculatrix thurberiella* Busck.	Mexico or southwestern United States.	Abundant only on southern borders of California and Arizona.	Skeletonizes leaves	do	Dust with powdered lead arsenate, 5 to 7 pounds per acre. Destroy old plants. Plant cotton annually on well-prepared land.
Thurberia weevil	*Anthonomus grandis thurberiae* Pierce.	Arizona and Mexico.	Southeastern Arizona.	Similar to boll weevil	do	Quarantines protect uninfested areas. Destroy old stalks in winter. Controlled like boll weevil.

Cultural Control

All cotton pests can be controlled to some extent by cultural practices, and for many of them no other satisfactory control measures are known. Attention should be given first to certain factors that are not considered primarily as control measures but are farm practices having an important bearing on the abundance of insects and upon the ability of the plants to produce satisfactory crops when insect pests are numerous. It is advisable to follow the recommendations of this department and the State experiment stations as to what varieties to plant, fertilizers, time of planting, spacing, methods of culture, and crop rotations. Each of these factors is directly or indirectly connected with the control of certain insect pests. In general, early maturing varieties are preferable where boll weevils or bollworms are abundant. The proper use of fertilizers will cause the plants to develop rapidly and to outgrow injury caused by plant lice. Early planting may enable the grower to mature a crop of cotton before insects become numerous. Where the boll weevil is prevalent cotton planted thickly is more productive than that thinly spaced. Thorough cultivation keeps the cotton growing vigorously and better able to withstand or outgrow insect attacks. Fall and winter plowing and properly planned rotations are also helpful in reducing insect injury.

In addition to these good farm practices that may be considered also as cultural control measures against insects, there are other practices that are recommended especially for insect control.

Few cotton growers appreciate the value of early destruction of the cotton stalks in controlling insects. This requires early picking of the crop, an excellent practice which minimizes loss in quality. Early destruction of the stalks stops the development of boll weevils, pink bollworms, and all other insects that continue to develop on cotton until they are checked by frost. The insects that develop in the late fall are those most likely to survive and infest the next crop. The destruction of their food causes insects that are already mature to begin overwintering in a weakened condition and therefore to be less able to survive.

Enlarging the cleared areas surrounding fields in which cotton is to be planted is considered by some successful planters the most important measure in control of the boll weevil. This simply means moving the hibernation places farther from the cotton fields, making it difficult for the weevils and other insects to find suitable places in which to pass the winter. The boll weevil is most likely to be abundant early in the season in localities where there are forests and other places in which to hibernate successfully.

Removing weeds and trash from fence rows, ditch banks, roadsides, and fields near cotton destroys many boll weevils and other insects that have found hiding places for the winter. The cotton flea hopper passes the winter as an egg in goatweed (croton), horsemint, evening-primrose, and other plants, and its numbers are reduced by the destruction of these plants during the fall or winter. This is also true of tree crickets and other insects that oviposit in weeds as well as in cotton plants, not to mention the red spider, the cotton aphid, the tarnished plant bug, and other insects that continue to feed and develop on weeds during mild winter weather.

Fall and winter plowing destroys boll weevils on the surface of the soil, pink bollworms on or near the surface, bollworms passing the

winter in the pupal stage, grasshoppers in the egg stage, and May beetles as grubs and as adults.

Keeping down grass and weeds in and near the cotton fields during the spring helps to prevent the increase of the red spider, the stalk borer, root and leaf aphids, the salt-marsh caterpillar, the fall army worm, the garden webworm, and many other injurious insects that develop on other plants before spreading to cotton.

Natural Control

Natural factors are constantly helping the cotton grower in his fight against insect pests. In the northern third of the Cotton Belt boll weevils are usually so greatly reduced in numbers by cold winters that the damage they cause the following season is negligible. This explains the small boll-weevil loss in Missouri, Tennessee, and Virginia. In the western sections of Oklahoma and Texas, not only the cold winters but the hot, dry summers prevent the boll weevil from becoming abundant and have checked its westward spread. These factors are always helpful in boll-weevil control. In seasons following extremely severe winters the survival of boll weevils is greatly reduced, and during periods of severe drought boll-weevil injury is often so effectively checked that direct control measures are not needed.

Rainy spells favorable to boll-weevil increase usually check the red spider, which seldom becomes serious except during or immediately after a period of dry weather. Heavy showers wash off many plant lice.

Predacious and parasitic insects, spiders, and birds are among the chief natural enemies of cotton insects. The numbers of every cotton insect are reduced to some extent by these agents. More than 60 parasitic and predacious insects and more than 50 birds have been recorded as enemies of the boll weevil alone.

Protection by Quarantines

The boll weevil, which came into the United States from Mexico, and the pink bollworm, originally from India but also introduced into this country through Mexico, are now generally recognized as the two most injurious cotton insects. Their introduction into this country emphasizes the possibility and danger of the introduction of many other cotton insects. In Central America, South America, Asia, Africa, and the West Indies there are destructive cotton insects that should be kept out of this country.

Cotton growers are now protected by the enforcement of a quarantine that greatly reduces the danger of the introduction of foreign insect pests. Also, the enforcement of domestic quarantines is checking the spread of the pink bollworm and the Thurberia weevil from the limited areas where they now occur in this country. Few cotton growers fully appreciate the protection they are receiving through the enforcement of these quarantine measures. Quarantine enforcement has also delayed the spread of the Japanese beetle and the European corn borer. These foreign insects are now becoming established in States north of the Cotton Belt and in a few years will probably reach cotton-growing areas. There is reason to fear that both will add somewhat to the troubles of the cotton grower, but it is hoped that they will not become cotton pests of major importance.

Control by Insecticides

Calcium arsenate dusted at the rate of 4 to 6 pounds per acre is the insecticide most generally used in cotton fields. No better control for the boll weevil has yet been developed. On good land, when boll weevils are numerous, dusting with calcium arsenate is profitable and millions of pounds are used annually for this purpose. It is also recommended for the bollworm, the leaf worm, the square borer, the garden webworm, the yellow-striped army worm, and other chewing insects that feed on cotton foliage.

Lead arsenate dusted on the plants at the rate of 5 to 7 pounds per acre is recommended for use against the cotton leaf perforator. It may also be combined with or substituted for calcium arsenate in controlling many other insects.

Paris green is especially valuable against the leaf worm because of its quick action in killing the worms. To prevent burning of foliage 6 pounds of calcium arsenate or lime is mixed with each pound of paris green.

Sulphur, finely ground and dusted at the rate of 10 pounds to the acre, is recommended for control of the cotton flea hopper, the cotton plant bug, the tarnished plant bug, and the red spider.

The standard control for plant lice on cotton is 2.5 per cent nicotine sulphate applied as a dust made by mixing 6¼ pounds (5 pints) of 40 per cent nicotine sulphate with 100 pounds of hydrated lime, or with 100 pounds of calcium arsenate if it is necessary to check the boll weevil at the same time.

Occasionally the fall army worm or the southern grass worm, cutworms, grasshoppers, and crickets must be checked in cotton fields by the use of poisoned-bran mash made by thoroughly mixing 25 pounds of wheat bran with an arsenical poison (1 pound of paris green or white arsenic or 2 pounds of calcium arsenate), adding 2 quarts of molasses diluted with 3 gallons of water, and stirring until the mixture is a crumbly mass that can be broadcast at the rate of 10 pounds per acre.

Insecticides must be used intelligently if satisfactory results are to be obtained. In no case is it necessary or desirable to apply an insecticide to cotton until the insects are actually present. Unless approximately 10 per cent of the squares are infested, it is not economical to dust for the control of the boll weevil. If such an infestation does exist, the applications should be made at intervals of four or five days until the infestation is brought below 10 per cent. At least three or four applications will be needed.

Sometimes growers make the mistake of applying calcium arsenate when so few weevils are present that the time and materials used are wasted. Another mistake sometimes made is to stop poisoning operations too early because the cotton has matured and few squares are present. Under such conditions one or two extra applications of calcium arsenate may save many bolls and greatly increase the yield of cotton.

Experience has taught some planters that it is profitable to observe insect conditions carefully and to apply poison only to those parts of the fields that need it. In early summer sometimes only the outer borders of large fields are infested with weevils. The cotton leaf worm moths usually deposit their eggs first on the rankest-growing and most succulent cotton. The red spider and certain other pests may be present only on the outer rows or on the ends of rows next

to weeds or other plants. By treating only the infested parts of the fields much time and money is saved.

Additional information on cotton insects and the control of injurious forms may be obtained by addressing the Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

R. W. HARNED, *Bureau of Entomology.*

ONE-VARIETY Community Plan Shows Numerous Practical Advantages Investigations of the problems involved in the improvement of cotton production in the United States have been in progress in the Department of Agriculture for many years, but the need of more intensive work was recognized about 20 years ago, largely as a result of complaints from cotton manufacturers that the average quality of cotton produced in the United States had deteriorated. Furthermore, the efforts made at that time to demonstrate better methods of production to cotton growers showed many underlying problems whose solution would serve as a basis for more effective measures of improvement.

Principal Causes of Deterioration

Studies of the prevailing methods of growing, harvesting, ginning, and handling the cotton crop showed the following major contributing causes of the decline in quality:

The almost complete absence of any constructive plan of maintaining soil fertility on cotton farms.

A general increase in the planting of inferior, early-maturing varieties, and varieties with high lint percentage, resulting from the belief that such varieties offered the best chance of defeating the boll weevil and producing a profitable crop under weevil infestations.

The prevailing practice of planting many different varieties in the same neighborhood, with the consequent cross-pollination and mongrelizing of inferior and good varieties.

Mixing seed of inferior and good varieties at public gins, and mixing inferior and good fiber in the bales.

General use of this mongrelized gin-run seed for planting.

The growing tendency of ginners, in response to the demand from growers for high lint outturn, to speed up the ginning operation for quantity instead of quality, causing serious damage to grade and spinning utility of the fiber.

The practice of "hog-round" or flat-rate buying in the primary or local markets. This system did not provide for the paying of fair premiums for better cotton, prices being based on the average quality produced in each district, usually with no advantage to the farmers who planted better varieties.

Early Efforts at Improvement

Publication of the facts in bulletins and reports by the United States Department of Agriculture and by State institutions brought the deplorable conditions of production and marketing of American cotton to the attention of growers, ginners, buyers, manufacturers, and the general public two decades ago. This resulted in a campaign for improvement that has been intensively carried forward by Federal and State institutions and by many leaders in southern agriculture.

Educational demonstrations of improved methods of farm practice were conducted, and showed the advantages of restricting cotton planting to the better soils, maintaining soil fertility by the proper use of fertilizers and suitable crop rotations, increasing home production of food and feed crops, and following other improved farm practices. Many superior varieties of cotton, producing larger crops of

better fiber and adapted to conditions in the United States, were discovered and developed by the Department of Agriculture, by State colleges and experiment stations, and by private breeders. The plan of restricting planting to a single variety in each gin community was shown to be the only practical way to avoid mixing seed at the gins, to increase and maintain the stocks of pure seed, and to make supplies of better fiber regularly available in the commercial quantities required by manufacturers. A new method of thick spacing of the cotton plants in the rows was demonstrated as a means of producing earlier and larger crops under boll-weevil infestation. Other important measures of indirect and direct control of the boll weevil, easily applied on the farm, were discovered and their practical utility demonstrated.

All these measures were simple and could be applied at little expense by the farmers themselves. But while some were put into practice in a few of the more progressive districts, the use of superior varieties at first did not become popular with growers, and for a time but little progress was made in improving the quality of the crop. Several reasons for this lack of interest were recognized, but the principal underlying cause was the failure of buyers and manufacturers to adjust their buying methods in the local markets to provide for payment of fair premiums for the better cotton and for commensurate discounts for poor fiber. Growers were not interested in producing better cotton unless better prices could be obtained for the fiber. Local buyers were accustomed to buying at the lowest possible price, separating the better bales, and selling to the manufacturer at the highest possible premiums, but the premiums went to the buyer instead of to the producer. Under these conditions the average grower would not readily change to a purebred variety with a better staple unless he were sure of a substantial increase in yield, because the better fiber returned him no higher price per pound than the same grade of short inferior cotton grown from mixed gin-run seed.

Recent Developments in Production Improvement

During the World War the demand for all kinds of cotton increased greatly, and with highly inflated prices interest was concentrated largely on quantity rather than quality production. But with the severe slump in the market shortly after the war, when prices fell rapidly to below cost of production over a large part of the Cotton Belt, attention was called again to the serious condition of the cotton industry and the great need of improvement in production.

As a result of renewed and more intensified efforts by Federal, State, and private organizations throughout the South, within the last 10 years there has been gradually building in the cotton industry a permanent structure of cooperation in production and marketing that promises to be mutually beneficial to growers, manufacturers, the consuming public, and the Nation. The more important agencies of improvement are: (1) The organization in the cotton States of cooperative growers' and marketing associations; (2) the establishment of cooperative one-variety communities in the irrigated valleys of the Southwest; (3) cotton-production contests; (4) reports by the Bureau of Agricultural Economics on grade and staple of American cotton; and (5) a cooperative project to encourage and assist throughout the South, the development of cooperative cotton production in one-variety communities.

Cooperative Marketing Associations

The organization of cooperative marketing associations was the growers' first collective move of protest against the inequitable system under which they were forced to market their crop, and the first constructive effort to place themselves in a position to obtain better prices for better cotton and to eliminate the hog-round system of buying. Advances to members of such associations have been made on a basis of the staple length of their cotton, and this policy has been adopted also in buying cotton from the farmers in many localities. These associations have made substantial growth, and every cotton State from North Carolina to California has established separately or jointly a co-operative growers' or marketing organization.

One-Variety Communities

With the extension of cotton production into the irrigated valleys of western Texas, New Mexico, Arizona, and California, the establishment of a quality basis for cotton growing in these new districts was recognized as a necessary means of overcoming the handicaps of higher cost of production and of transportation to manufacturing centers. A genuine local interest and good leadership, with the natural advantages of isolation from the older producing regions, afforded an excellent opportunity to demonstrate on a large scale the practical possibilities of the one-variety plan in a region far removed from influences of interfering traditions and prejudices and where the enormous advantages of standardization in agricultural crops were already recognized.

So favorably was the one-variety plan received that in 1925 a special act was passed by the California Legislature giving legal protection to communities where the farmers restricted themselves to growing a single variety of cotton. Several counties in California were established as pure-seed districts for the Acala variety, and the growing of any other variety was prohibited in those counties.

Production Contests

One of the most helpful influences in stimulating interest in planting better varieties was the cotton production contests initiated in 1925. Begun in Texas under the slogan "More Cotton on Fewer Acres" (later changed to "More and Better Cotton on Fewer Acres"), the spirit of these contests spread rapidly to many of the cotton-growing States, and under the careful guidance of leaders in the State institutions the contests have been for several years a regular part of the improvement program.

Their real value has been the practical demonstration to cotton growers that high yields and profitable production are not necessarily confined to varieties with very short staples and high lint turnout at the gin. Many prizes have been awarded to growers of varieties that produce a staple fifteen-sixteenth inch or more in length, with large storm-proof bolls, easy to harvest, and at a cost lower than that of the small bolls of inferior mongrel cotton grown from gin-run seed.

Grade and Staple Reports

The publication of reports by the Bureau of Agricultural Economics of the Department of Agriculture on the grade and staple of the cotton produced in the United States has been a helpful contribution to the

efforts to improve cotton quality. Beginning with the 1928–29 crop, these reports have appeared at regular intervals during the seasons, and by means of carefully collected statistical data they have shown in percentage figures and in numbers of bales the different grades and staple lengths of the carry-over and of the current crops. That increasing quantities of short, irregular fiber of inferior quality were being produced in the United States was not doubted, but not until the appearance of these reports were figures available to show the high percentage of the total crop that was inferior cotton. Substantially lower percentages of untenderable cotton below ⅞-inch staple, as shown in later reports, indicate an increase in the planting of improved varieties, though favorable seasonal conditions undoubtedly have been responsible for some of the improvement. For example, varieties producing ⅞-inch staple under normal seasonal conditions probably would run fifteen-sixteenth inch in length in favorable seasons, but the fiber may be shortened to thirteen-sixteenth inch in unfavorable seasons. Thus the percentage of the crop just above or below the tenderable length of seven-eighth inch may fluctuate rather widely between two seasons.

Other factors such as impoverished soils, use of fertilizers, etc., must be taken into account in evaluating the grade and staple reports, but there is ample evidence that the publication of these reports has led to increased plantings of better varieties, especially in States where the higher percentages of untenderable cotton were being produced.

Recent Progress in One-Variety Communities

The most recent development in production improvements was begun in December, 1930, in the form of an active cooperation between the Bureau of Plant Industry, the American Cotton Cooperative Association, and affiliated State agencies, to encourage the establishment of one-variety communities. The active interest on the part of leaders in the marketing associations was evidence of a growing appreciation of the fundamental need for cooperation in cotton production as well as in marketing, and of the fact that permanent improvement in the quality of American cotton could not be assured until the necessary basic units of cooperative production were established and large supplies of pure premium seed were regularly made available and planted.

The original plan of the cooperative effort provided for the establishment of at least one community unit in each of the cotton States, but this has not been practicable with the facilities and personnel available. Many requests for assistance in establishing one-variety communities have come to the department from practically all the cotton States, and while it has not been possible to comply with all, advisory assistance has been given in many communities.

If supplies of pure seed had been available, there is no doubt that one-variety communities could have been established in many sections of the Cotton Belt; but experience had shown that better and more permanent progress could be made with a few well-selected districts where the necessary local interest and leadership were available and where assistance in organizing the local associations could be more continuously supplied throughout the season. Such districts serve as demonstration areas where the practical advantages of the community plan can be shown.

With the interest and cooperation of the State colleges and extension services, State experiment stations, vocational teachers, and local agricultural leaders, an active campaign of education and assistance in

organizing one-variety communities has been going forward, and substantial progress is being made. Approximately 75 one-variety community units are now operating from North Carolina to Texas under the general supervision of State and Federal agencies, with a total of more than 200,000 acres harvested in 1932. The most notable progress has been in Mississippi, where approximately 50 such communities have organized during the last two years. With only three exceptions the Mississippi communities are in the hill-land areas. In the Delta region of the State, a large percentage of the cotton has for several years been planted to the same parent variety. By adding approximately 400,000 acres in the Southwest, and the many areas devoted to the planting of one kind of cotton that are being encouraged in several States by cotton mills and dealers in connection with commercial seed-breeding enterprises, the extent of the growth of the one-variety plan can be appreciated.

Spinning Quality of Cotton from One-Variety Communities

The almost complete lack of information among cotton manufacturers about the problems of the cotton producer, and among breeders and growers on the problems and requirements of the manufacturers, has interfered greatly with progress in improving the quality of American cotton. These agencies have for many years shown little interest or concern for each other, but during the last few years special efforts have been made to bring them to better mutual understanding. Manufactures are being drawn closer to the field of production through cooperative spinning tests on cotton produced in one-variety communities, and information on fiber characters determining spinning utility is being made available to breeders and growers. In addition to the cooperative mill tests, many mills throughout the South have become independently interested in cotton from one-variety communities. Substantial premiums are being paid for the community cotton, and large manufacturers offer a regular market for thousands of bales if the cotton can be made regularly available in the large quantities required.

Requirements for a One-Variety Community

Several basic and fundamental requirements should be fully understood and applied in every district where the community plan is undertaken.

Competent local leadership must be available to develop and maintain community interest and responsibility among the growers. Success is not to be expected where the county agent or any outside agency or individual attempts to organize a community and assumes the responsibility of leading its activities. It has been demonstrated many times that communities can be easily started on this basis, but that the movement eventually fails. Growers should appreciate in the beginning that improvement in production is their problem and is a community responsibility, and that local problems must be worked out by the growers themselves. Otherwise, confusion and disappointments usually develop in a short time, especially in unfavorable seasons.

It should also be understood in advance that the principal object is to produce fiber of more uniform quality and make it regularly available to the trade in the commercial quantities that are necessary to establish a community reputation for better cotton and to obtain a higher return. It is a mistake for growers to gain the impression that

large profits can be made from the sale of pure seed to other districts. When such hopes are not realized, they lose interest and the community effort may fail.

Experience has shown that, to be successful, one-variety organizations should arrange their seed-production programs so as to have pure seed regularly available on a nonprofit basis to all the growers within the community. Conditions differ in different communities, but the most satisfactory arrangement has been to fix the price of seed on the basis of oil-mill prices plus the necessary costs of handling. It has also been shown that the increased stocks of pure seed produced in the communities will be more extensively utilized if they are sold regularly at low cost or exchanged for oil-mill seed.

Two Kinds of One-Variety Communities

Recent investigations indicate that two kinds of one-variety communities may be effectively organized and developed: (1) Pure-seed communities, confined exclusively to a single variety, where the necessary breeding and selection work to maintain the purity and quality of the seed stocks is a regular part of the program; and (2) production communities, where large areas are planted to one kind of cotton with stocks of pure seed replenished annually or biennially from other communities or from responsible and qualified commercial seed breeders and increased by selected growers for community planting.

For one or two seasons after a one-variety community is organized, it may be necessary to gin the cotton from that community on special gin days, in order to prevent mixing the seed with the seed of varieties from other communities. With proper safeguards, large stocks of relatively high-grade seed can be produced for more general planting, and if this seed is made available to growers in other communities, at low prices, it should be widely utilized. Areas where these larger increases in the use of the variety have taken place, will have an important part in the general improvement program, but it is impossible to make permanent improvements in cotton production unless supplies of pure seed of the varieties that command premiums are regularly produced and made available from the pure-seed centers.

Another basic requirement is that growers themselves select the variety to be planted. Popular community selection, instead of direct recommendation from the outside, greatly assists to preserve the community spirit of responsibility and interest and largely avoids dissatisfaction, especially after an unfavorable season when the usual procedure of many farmers is to change their variety. Another very important point is for growers to agree to plant the selected variety for a continuous period of three to five years, which is necessary to obtain a fair reading of the average results from the variety under local conditions. The community should build up a reputation for the superior quality of its cotton, and this may require several years. When a reputation has been made and actual values established, the importance of maintaining them should be recognized. The most effective and practical means of meeting possible complaints against the selected variety during this period is a well-conducted and properly safeguarded variety test in the community each year. In addition to the selected variety, one or two other varieties in which some of the growers may be interested should be included in the test planting, so that their comparative behavior under the different seasonal conditions can be demonstrated.

Since conditions differ in each locality, and no single plan of conducting the organization will be applicable to all communities, the most satisfactory plan for producing and handling seed stocks, solving cultural problems, obtaining insect control, marketing the crop, etc., must be worked out for each district by the growers themselves, with such assistance as may be obtainable from the State institutions and from the United States Department of Agriculture.

Advantages of the One-Variety Community

The more important practical advantages that experience has shown are available to growers through cooperative one-variety community production of cotton may be summarized as follows:

It is the only way to produce uniform, high-quality cotton in commercial quantities for which there is always a good demand.

It is the only practical way to develop and maintain local supplies of pure seed where they can be made available at a popular price.

It is the most effective way to discourage the introduction of seed of miscellaneous untried varieties until proof of superiority over the local variety is demonstrated. Then all the growers in the community can change to the better variety at once.

Mongrelizing of varieties by cross-pollination in the fields and the mixing of seed at the gin are avoided.

Improvements in yield, quality, and uniformity of the lint are obtained.

Pure planting seed of the best quality is made available every year at a minimum cost to community members.

The grower's problems in cultural methods, fertilizers, and disease and insect control can be more effectively worked out by concentrating upon one variety.

With one superior variety in the community, and planting restricted to the better soils, yields per acre of premium cotton can be increased at least 10 per cent, and production can be maintained on a smaller proportion of the farm area, at no extra expense.

A uniform wage for cotton picking is easier to establish.

Better adjustments of ginning machinery can be maintained with one kind of cotton, and a better quality of fiber should result.

When ginning where no other variety is ginned, bales can not be plated with inferior fiber from other varieties.

Growers can purchase and operate the gin cooperatively, and this should assure lower ginning costs as well as quality instead of quantity production.

Problems of financing are simplified when the product is standardized.

Select seed stocks can be developed locally and the surplus sold for planting purposes in other districts.

Grading, classing, and assembling bales in even-running lots can be greatly simplified and the cost of marketing cotton all known to be of one variety is lower.

The community can establish a reputation for producing uniform, high-quality cotton, and thus attract large buyers or mill representatives.

Growers are able to get current premiums for staple length or higher premiums for large lots of even-running bales.

The bales produced in the community can be identified by an identification mark, to keep farmers in neighboring mixed-variety districts from selling their inferior cotton in the community for a higher average price and eventually injuring the community reputation for good cotton.

If the community's bales are identified by authenticated samples taken at the gins, later sampling is not necessary, and the gin-compressed bales can remain completely protected in standardized wrapping, to the vast improvement of their appearance and condition in the markets of the world.

The development of the cooperative plan should provide more effective means of acreage control, and replace the present extensive and wasteful methods with a more intensive, well-balanced production program. Intensive methods are not directed toward increasing the total production of cotton in the United States, but toward placing the crop on a quality instead of a quantity basis, with better returns to the producer. It is the relation of selling price to cost of production that determines the profitableness of the cotton crop to the producer.

Standardization in cotton production facilitates cooperative effort in all lines of agricultural, industrial, and social interest in the community, to the mutual benefit of the entire community, the State, and the Nation.

O. F. COOK *and* C. B. DOYLE, *Bureau of Plant Industry.*

WHEAT ✓

WHEAT'S Economic Position Affected by Surpluses and World Trade Restrictions Many changes affecting the economic position of wheat in the United States have occurred in the last 10 years. Outstanding among them have been a marked increase in world wheat production, increases in tariffs and increases in milling restrictions of importing countries, and growing surpluses of wheat in exporting countries. Underlying these relatively recent changes, however, have been trends and shifts of production and consumption that have been in evidence over a much longer period, together with the consequences of the World War.

Domestic Production

In 1866, just after the close of the Civil War, the United States produced 170,000,000 bushels of wheat. During the next 15 years production increased at the rate of over 20,000,000 bushels a year. It was stimulated by liberal homesteading laws that opened up to settlement vast stretches of land in the Great Plains, by the extension of railroads into the great prairie regions, the introduction of new varieties of wheat better adapted to the drier areas west of the Mississippi, and by improved seeding and harvesting machinery. The passage of the homestead law in 1862 opened up large areas of public lands west of the Mississippi River on very liberal terms and many men returning from the war moved on to the frontier, acquired new farms and engaged in agriculture. Large land grants were made to States and corporations, including railroads, and these endeavored to promote settlement by offering land for sale at low prices. By 1870 a railroad had been completed from Omaha to Salt Lake City and San Francisco, completing a transcontinental line. Another road had been extended from Kansas City to Denver. These two railroads brought the fertile lands of Kansas and Nebraska within reach of eastern markets and wheat production expanded rapidly into this area. Both acreage and production nearly doubled in the United States in the 10-year period 1870–1879.

The invention and development of the reaper by Cyrus McCormick, and the rapid distribution of this machine through the wheat-growing sections gave further impetus to wheat production by lessening the labor of harvesting and reducing the cost. The introduction of threshers driven by tractor engines also contributed to the expansion of wheat growing. Another influence was the Mennonites' introduction into Kansas of the drought-resisting Turkey Red wheat in the early

seventies. The success of this wheat under semiarid conditions aided in the permanent development of wheat production in the West and Southwest.

During the next 10 years, 1880 to 1890, there was no great change in either the acreage or production of wheat in the United States, but a material shift in important producing areas occurred. Acreage increased in the spring-wheat district of the northern Great Plains with the extension of the railroads in that area. The hard-winter district of central Kansas and the dry-farmed areas of the far West also showed a marked increase, whereas production in the upper Mississippi Valley suffered a corresponding decrease.

Another era of expansion in the wheat area began about 1890 and continued to about 1900, when production reached an average level of about 675,000,000 bushels. The opening of Oklahoma to settlement extended wheat production into that important area. The breaking of new lands in Minnesota and the Dakotas resulted in greatly increased wheat production in those States until 1899. In that year Minnesota alone produced more wheat than the entire Nation had produced in 1839 and the Dakotas more than the total United States crop in 1849. With so rapid an expansion in acreage, production greatly exceeded domestic requirements and United States wheat entered more largely into export trade. This increased competition in foreign markets lowered prices and brought about some recession in wheat growing in the United States during the next decade.

Beginning about 1912, another expansion in wheat acreage began under the stimulus of several years of rather satisfactory farm prices and increased domestic utilization which had enlarged from about 400,000,000 bushels in 1895 to nearly 600,000,000 in 1912. Production increased rapidly and in 1915, under the stimulus of higher prices following the outbreak of the World War, reached the highest point on record with a crop of 1,026,000,000 bushels. In 1916 and 1917 production was only about 60 per cent as great as in 1915, largely because of an epidemic of black stem rust in 1916 and because of drought and extensive winter killing in 1917. In 1918 a crop of nearly 900,000,000 bushels was produced, and in 1919 when acreage reached its highest point in response to the war-time urge to grow more wheat and under the stimulation of high prices caused by the war-time demand, the United States produced the second largest crop on record. Following this there was some recession in both acreage and production until 1923. The acreage then increased steadily until 1929, when, at 63,000,000 acres, it was nearly as large as in the years just after the war. Production also increased, reaching a high point of 926,000,000 bushels in 1928. Acreage was materially reduced from 1929 to 1931 when 55,000,000 acres were harvested. About the same area was harvested in 1932. Production in 1932 totaled only 727,000,000 bushels because of the reduced acreage and because of low yields of winter wheat.

In 1869 but little wheat was grown in the States west of Iowa, and the great bulk of the production of the United States was east of the Mississippi River. Wheat growing in Minnesota was then in its infancy and was confined almost entirely to the southeastern portion of the State. (Fig. 10.) Twenty years later there had been a marked shift. Although production in the States east of the Mississippi was not reduced, a great expansion to the westward had

occurred. The wheat-production map of 1889 (fig. 11) shows the beginning of production in two new areas where there was later to be a great concentration of wheat production—Kansas, and the Red River Valley of the North. By 1899, as shown by Figure 12,

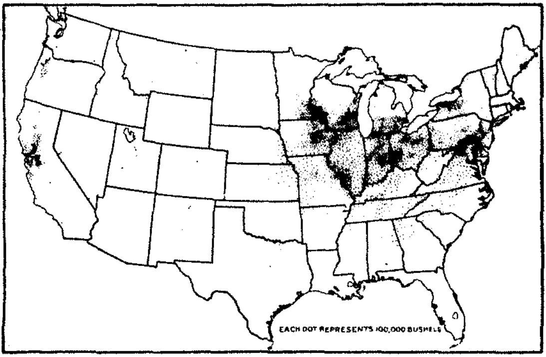


FIGURE 10.—Wheat production in 1869

the region in the vicinity of the Red River Valley was by all odds the most important wheat-growing region of the United States, though

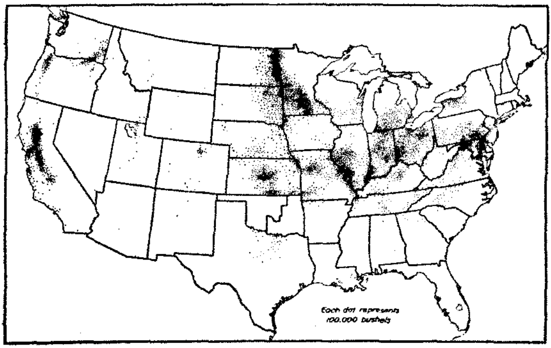


FIGURE 11.—Wheat production in 1889

Kansas wheat production also had increased, and this southwestern region had been extended downward into Oklahoma. In addition, California had grown in importance, and the Palouse wheat district of Washington, Oregon, and Idaho had become an important area.

In 1909 (figs. 13 and 14) there were four fairly well-defined regions of concentrated wheat production—the soft red winter wheat region, which extended from Missouri eastward; the hard winter wheat region, with production concentrated in southeastern Nebraska and

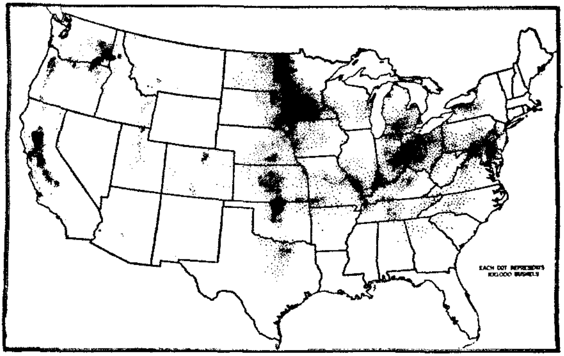


FIGURE 12.—Wheat production in 1899

central Kansas; the spring wheat region of the northern Great Plains, including the Red River Valley and most of North Dakota;

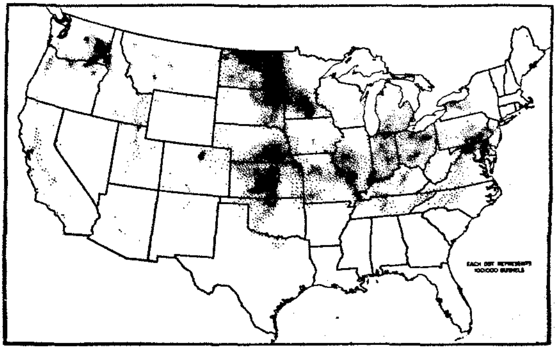


FIGURE 13.—Wheat production in 1909

and the Palouse district of Washington, Oregon, and Idaho. California had become a much less important wheat producer. These four areas are shown in Figure 13. In 1919 the same regions remained the principal wheat-producing regions. An outstanding change,

however, was the enlargement of the wheat area of the southwestern Great Plains, especially in western Kansas, Oklahoma, and Texas.

The hard winter wheat region had expanded still more by 1929 when it constituted the most important wheat-growing region of the United States, and produced the great bulk of the wheat available for export. During the period 1919 to 1929 production showed a decided tendency to concentrate in the Great Plains. In an area bounded on the east by a line from eastern North Dakota to eastern Texas and on the west by a line from eastern Washington to eastern Arizona the acreage devoted to wheat increased by one-fifth. In 1920 this area had about 60 per cent of the country's wheat acreage, and by 1930 nearly three-quarters of the total was concentrated there. East of this section there was a decrease of 40 per cent in the wheat acreage, while in the Pacific Coast States there was a decrease of about 4 per cent. These shifts in acreage brought about an increase

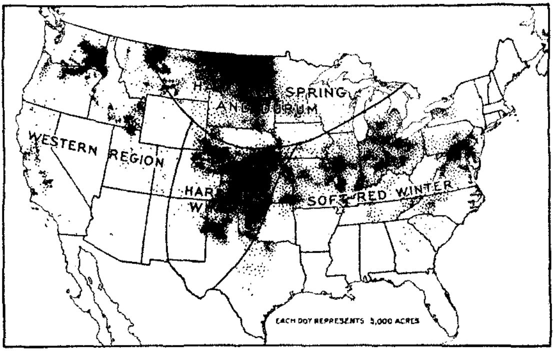


FIGURE 14.—Distribution of wheat in 1929. The heavy black lines show the approximate boundaries of the four principal wheat regions

in the production of hard red winter, hard red spring, and durum wheats, and a decrease in the production of soft red winter and white wheats. Relatively little change has occurred since 1929 in the geographic distribution of the wheat acreage of the United States and the hard red winter wheat region remains the most important producing region. (Fig. 14.)

Utilization of the United States Crop

In the 5-year period 1866–67 to 1870–71 domestic utilization of wheat averaged 200,000,000 bushels and net exports 34,000,000 bushels annually. Domestic consumption mounted rapidly; seed requirements increased with the increase in acreage, and other utilization increased with a rapidly growing population. The trends of domestic utilization and exports are shown by Figure 15. For the period 1881–82 to 1885–86 domestic utilization had risen to 350,000,000 bushels annually and net exports to 124,000,000 bushels.

During the eighty's, however, drastic price declines brought acreage and production to a standstill and while domestic consumption gradually increased, exports dropped off. Exports had reached a high point of 188,000,000 bushels in 1880–81, whereas toward the close of the decade they averaged only about 100,000,000 bushels annually. Another increase in exports took place in the early ninety's but from 1890 on, year-to-year fluctuations in exports were very great and there was no longer a marked upward trend. In 1891–92 net exports amounted to 229,000,000 bushels compared with 109,000,000 in the previous year, but so high a level was not again reached until 1901–2, when they totaled 239,000,000 bushels. After 1902 there was a general downward trend in exports until about 1910—the result of growing domestic needs and a gradually declining level of production. In the years 1906–7 to 1910–11 domestic

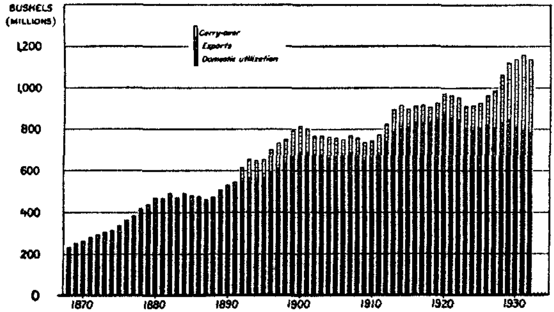


FIGURE 15.—Disposition of United States wheat supplies. The bars for each year represent 5-year moving averages of the actual yearly figures and show the trend of domestic utilization, exports, and stocks from 1868 to 1932. Carry-over data for the earlier years are not available

utilization averaged 546,000,000 bushels annually and exports only 118,000,000 bushels.

Prices, however, had been gradually improving since 1895, with occasional upward swings carrying wheat at the principal United States markets above the dollar mark. This price improvement was the result of an expanding European import market which more than kept pace with the growth of exports from countries other than the United States. The advance in prices, together with the development of new methods of production suitable to the semiarid regions of the West, resulted in an increase of acreage and production in the United States and provided an increasing volume for export. Domestic utilization, however, was growing less rapidly and most of the increased production was turned into export channels. The World War resulted in a greatly increased demand for American wheat, and in 1914–15 the largest exports of our history were made—a total of 335,000,000 bushels.

Since 1920 the domestic use of wheat for food, feed, and seed has changed very little except for an increase in the last two years from about 600,000,000 bushels annually to about 700,000,000 bushels. The increase was brought about almost entirely by increased feeding of

wheat to livestock. About 160,000,000 bushels of wheat were used for feed in 1930–31, following the drought of 1930 which caused a shortage of feed-grain production over a large area. An even greater amount of wheat from the 1931 crop was fed to livestock, largely as a result of the very low prices of wheat together with relatively high prices of feed grains. In the five years previous to 1930, less than 50,000,000 bushels annually were used for feed. Yearly net exports of wheat dropped from 313,000,000 bushels in 1920–21 to 124,000,000 bushels in 1931–32, most of the decline occurring during the last half of the period.

From 1919 to 1928 the carry-over of wheat averaged 125,000,000 bushels or approximately 15 per cent of the annual production. In 1927 and 1928 the wheat crops averaged about 900,000,000 bushels. By this time exports had fallen off considerably from the 1920 level and domestic consumption had shown little increase. Consequently the carry-over at the beginning of the 1928 crop season was relatively large. Since then, exports have continued to decline and the carry-over has continued to increase until, at the beginning of the 1932 season, it was nearly three times as large as during the period 1919 to 1928. The carry-over into the 1932 season was more than half as large as the crop produced in that year.

World Production and Supplies

For an explanation of the decrease in exports and the consequent increase in the United States carry-over it is necessary to consider the world situation. Before the World War there were four outstanding wheat-exporting countries—Russia, the United States, Canada, and Argentina. Also of considerable importance were Rumania, British India, Australia, and Hungary, each with average yearly exports of about 50,000,000 bushels. The United States and Russia had been very important sources of wheat supplies for the importing countries for many years before the World War. Argentina, Canada, and Australia had come into prominence in more recent years and were of growing importance. In the years just before the war, Russia was the largest exporter, but soon after the outbreak of the war, its exports were cut off and the importing countries of Europe had to rely almost entirely upon the United States, Canada, Argentina, and Australia for their wheat supplies. Furthermore, the war had reduced production in Europe and increased import needs. This increased demand resulted in a great expansion of wheat production, not only in the United States but also in Canada, Argentina, and Australia during the war period and in the years immediately following. The stimulus thus given to wheat growing in these countries was further augmented by the greater mechanization of wheat production that made it possible for increased areas in the subhumid regions to be planted and harvested at what were then considered low production costs.

This war and post-war expansion in the newer wheat areas, combined with the post-war rehabilitation of parts of the wheat-growing area of Europe, resulted in a great increase in world production. The wheat acreage of the world (excluding Russia and China) increased from 225,000,000 acres in 1921–22 to 252,000,000 in 1928–29. Russian acreage increased from 38,000,000 to 68,000,000 acres during the same period. The effect of this increase in acreage was aggravated by two successive years of unusually high yields. In both 1927–28 and 1928–29, yield per acre for the world (excluding Russia and China) was over

15 bushels compared with an average for the preceding five years of 14.6 bushels.

The result of the increase in acreage and the high yields was, of course, large harvests. World production (excluding Russia and China) increased from a level of about 3,200,000,000 bushels in 1921–22 and 1922–23 to slightly over 4,000,000,000 bushels in 1928–29. Although world consumption also had been increasing, production had increased more rapidly, and the result was a mounting world carry-over. Total stocks accounted for as of July 1, which consisted primarily of stocks in North America, Australia, and Argentina, mounted from a level of around 300,000,000 bushels in 1921–22 to over 600,000,000 at the close of the 1928–29 crop year.

The increasing acreage in Russia after the war represented not merely an attempt to increase its own food supply, but also an attempt to regain its former place as an exporter of wheat to other nations. From the time it had first dropped out of the picture as a wheat exporter during the war until the end of the crop year 1929–30, Russia's exports had never amounted to much, the largest figure for any crop year being that for 1926–27 when her overseas shipments amounted to 49,000,000 bushels. In 1930–31, however, as a result both of its rapidly increasing acreage and of favorable yields, exports from Russia totaled 112,000,000 bushels, and in 1931–32 they amounted to 72,000,000 bushels. Hence, Russia reappeared as an important competitor of the other exporting countries at a time when they were already burdened with heavy stocks and in the throes of an attempt to readjust their wheat production to prevailing levels of consumption.

These large crops, the increased carry-overs, and the re-entry of Russia as an important exporter tended to lower prices and with the development of a serious world-wide business depression, prices declined drastically to the lowest levels in the history of the United States. Similar declines were registered in the markets of the other exporting countries and of those importing countries where free importation was allowed. Only in the markets of some of the importing countries of Europe where drastic tariffs and other import and milling restrictions were imposed were prices maintained at levels approaching those of 1928 and before.

The tendency of these low prices has been to check acreage expansion and to increase consumption. Since 1928–29 total world acreage (excluding Russia and China) has shown relatively little change. Russian acreage, however, has continued to increase, rising from 68,000,000 acres in 1928–29 to 92,000,000 in 1931–32.

The World Wheat Situation

The economic position of wheat in the United States is largely dependent upon the world wheat situation. The present very low prices in the United States, as well as the declining exports of the last three years, have been due to the large world production of wheat and the world-wide business depression. Now, as in the past, the volume of exports from the United States and the extent to which wheat-growing is carried on within our borders depend very largely upon the size of the import market in Europe and upon how well the American wheat-growing industry is able to compete with that of other exporting regions. In recent years some non-European countries, primarily Japan

and China, have also become important markets for wheat and flour so that the prospects for the oriental market have become an important item to consider.

The amount of wheat that European countries will import depends principally upon the extent to which tariffs and other wheat and flour import restrictions stimulate European production and restrain European consumption of wheat; also upon the general prosperity and purchasing power of the European countries. The oriental market appears to be very sensitive to prices, low prices resulting in large imports and high prices in small imports. In addition, however, oriental imports from the western world are dependent upon wheat production in China and Manchuria and upon the accessibility of the present and potential wheat-growing regions of these countries to the industrial and commercial centers of Japan and eastern China.

The present competitive position of the United States in relation to other wheat exporters is a difficult one. Although the efficiency of the wheat growers of the United States is high, it must be borne in mind that other countries have adopted, or, as in the case of Russia, are adopting, our most advanced machinery and methods of production. In Argentina, Australia, and Canada production is more predominantly from newer wheat lands. These foreign competitors also probably have greater opportunities for expanding production to virgin soil than has the United States, and their important wheat-growing areas are more accessible to ocean transportation.

G. A. Collier, Joseph L. Orr, *and* E. J. Working,
Bureau of Agricultural Economics.

NEARLY 300 Varieties of Wheat Grown on United States Farms

There are at least 30,000 distinct varieties and strains of wheat in the world. Nearly 300 of these are grown on farms in the United States. Some have been grown in this country for 100 years or more, in a few cases probably having decended from varieties brought over from Europe during the seventeenth century. Most of the varieties in the United States, however, have been introduced more recently from foreign countries or have been produced by plant breeders in the United States.

In the list of available wheat varieties are many different types. Some are winter varieties which can be successfully grown only from fall sowing, and others are spring varieties grown principally from spring seeding. Some are white, some are red; some have hard grain, some have soft grain; some are excellent for milling, and some are not. Some are widely adapted and produce good yields under many conditions; others produce good yields under special conditions only; and some are not satisfactory regardless of where or how they are grown.

With the large number of varieties, it is not strange that farmers sometimes find it difficult to decide which varieties to grow on a particular farm or in particular regions. (Fig. 14, p. 143.) Nor is it strange that old varieties are sometimes advertised under new names, or that farmers are sometimes misled into growing varieties not adapted to their conditions. To decide which variety is really the best for any particular State, county, or farm may be difficult with the best of information.

What to Consider in Choosing a Variety

There is much confusion regarding the characteristics that enable one always to distinguish a high-yielding variety from a poor one, and there are many erroneous ideas of what constitutes a good variety. It is a common notion that a variety with very long heads, a large number of grains per head, or several grains per mesh (spikelet) is necessarily good. Other things being equal, a variety with a large number of grains per head will produce a large yield. The difficulty is in assuming that other things are always equal. They never are. For example, Turkey, the most widely grown variety of wheat in the United States, has very small heads and seldom has more than two or three grains per spikelet. Under very favorable conditions, however, Turkey will produce 50 or more bushels per acre and is more productive than most other varieties in the regions where it is generally grown.

Winter Wheat Compared with Spring Wheat

Where the winters are not too severe, farmers usually find it to their advantage to grow winter wheat rather than spring wheat. In many regions conditions are usually more favorable for seeding in the fall than in the spring, and it is more convenient to seed at that time because of other work. Winter wheat usually matures earlier, and this often enables it to escape hot winds, drought, and insect and disease pests that sometimes seriously lower the yield and quality of spring wheat under the same conditions. There are exceptions, however, as, for instance, under irrigation, where spring wheat often yields as much as or more than winter wheat, and fits better into the rotation. Similarly, in regions characterized by very dry falls where it is difficult to get winter wheat started at the proper time, spring wheat may be preferable.

White Wheat Compared with Red Wheat

East of the Rocky Mountains red wheat is almost universally grown, except in New York and Michigan, where, because of a special demand for white wheat for the manufacture of certain breakfast cereals and pastry flour, the latter is grown to a considerable extent. West of the Rocky Mountains white wheats are grown more extensively than red-grained varieties and often command a market premium. Much of the wheat of this region is exported to western Europe and the Orient, where there is a demand for white wheat. There is no known inherent relation between the color of grain and the yield of varieties of wheat. There are high-yielding varieties in both groups. Generally speaking, the color of the variety selected should be that of the predominating market class in the area concerned.

Bearded and Beardless Wheats

In many sections of the country, particularly in the southern Great Plains, most of the wheat is bearded. In other sections, as in the spring-wheat belt until recently, most of the wheat has been beardless. Most of the wheat grown west of the Rocky Mountains also is beardless. In the eastern part of the United States the two groups appear to be about equally divided. Where the binder is used in harvesting, the awns cause considerable inconvenience, and many farmers prefer a

beardless variety. Where the combine is used it makes little difference whether wheat is bearded or not. Where windrowing is practiced awns are actually an advantage, since the bearded wheat is held up more effectively by the stubble, packs less, and dries more quickly.

In many parts of the country, however, bearded wheats are usually most productive. In Kansas, Nebraska, and elsewhere in the southern Great Plains the best-yielding varieties are bearded. In the hard spring wheat belt of North Dakota, South Dakota, Minnesota, and Montana the best bearded varieties also yield about 10 per cent more than those without beards. In the far western and eastern parts of the country there appears to be no consistent difference between the two groups. Generally speaking, the predominance of a class in any region may be taken as a reasonable guide to the probable superiority of bearded or beardless varieties.

Winter Hardiness

Any farmer growing winter wheat knows that he should grow only varieties able to survive the winter. In considering a new variety, however, information may be insufficient for a sound decision. It not infrequently happens that 2, 3, or even as many as 5 successive winters are mild and a new variety survives successfully, only to go out completely at the first real test. The United States Department of Agriculture, in cooperation with the State agricultural experiment stations, conducts extensive tests of new and standard varieties in order to obtain information on relative winter hardiness. Most of the new winter wheats put out by the department or the State stations have been tested and their degree of hardiness is known. Without this information no new winter variety should be grown on an extensive scale.

Shattering and Lodging

The extensive use of the combine (combined thresher-harvester) in recent years has emphasized the need of growing varieties that can stand without loss for a considerable time after they are ripe. Varieties differ widely in tendency to shatter. Some begin to shatter even before they are ripe, and if allowed to stand for any length of time thereafter show serious losses. Other varieties have weak straw and lodge easily. Still other varieties do not shatter under normal conditions and are more or less resistant to lodging. In some areas it is difficult to find good nonlodging varieties. In the hard red winter wheat belt, of which Kansas is the center, the varieties best adapted have rather weak straw. In other cases lodging may occur only rarely and need be given little consideration. Under an abundant rainfall and on a rich soil which promotes a rank growth, lodging is likely to occur, and it is then particularly desirable to choose varieties having the least tendency in this direction.

Resistance to Insects and Diseases

Insects and plant diseases exact a heavy toll from the wheat grower. Moreover, there is a tendency for these losses to increase; in fact, there are important wheat-growing areas where wheat could not be grown were it not for the use of control methods that were unknown 25 years ago. Bunt or stinking smut, loose smut, stem rust, black chaff, Hessian fly,

chinch bug, false wireworm, and wheat stem maggot are the more important pests. Fortunately, there are varieties of wheat resistant to one or more of these enemies, and for several parts of the country adapted varieties resistant to one or more most important pests have been developed. Ceres wheat, resistant to stem rust, is an example. This new variety, partly because of its resistance and partly because of other good characteristics, is now grown on approximately 5,000,000 acres in the hard red spring wheat region of the United States and Canada. Ridit, Albit, and Oro are resistant to bunt, and their acreage is increasing in the Pacific Northwest. Some varieties are resistant to Hessian fly, others to leaf rust, and still others to the black chaff disease. Resistance to disease should be given increasing consideration in choosing varieties; and while this factor should not completely overshadow other factors that determine varietal value, it may in some cases mean the difference between success and failure. Particularly is this true of resistance to stem rust or smut where these diseases are most serious.

Time of Maturity and Yield

There is an important relation between time of maturity and yield, although for many sections of the country this relation is not very definitely known. An early-maturing wheat, for example, is much more likely to escape damage from hot winds, drought, and rust than is one that matures late. On the contrary, a late-maturing variety is very sure to be better yielding in regions without pests, and with favorable climatic conditions and good soil. It requires some time for a wheat plant to elaborate the materials that go into the grain, and when conditions are favorable, the longer the plant can grow the greater the weight of grain it can produce.

No general rule on the subject can be given, but within reasonable limits early-maturing varieties usually produce the best yields in the Great Plains region and elsewhere in the southern half of the United States. Toward the northern boundary, where there is a tendency toward cooler summers and in some cases more abundant summer rainfall, later-maturing varieties are relatively better, except as they may be more severely injured by stem rust. In any case the date of maturity should be early enough to escape any regularly recurring unfavorable condition, such as heat, drought, rust, etc., which occurs year after year at about the same time. If there are no unfavorable factors interfering, it is often advantageous to grow an early and a late variety on the same farm, so that not all of the wheat will ripen at the same time and harvest labor can be distributed better.

Quality

Quality plays a more important rôle in determining the value of wheat than of other grain crops. This is because of the use of wheat as human food, and of the fact that the different technical processes through which the grain and its products pass in being prepared for food are favored by the degree to which certain plant characteristics are developed. Quality has a different meaning for different classes of wheat, and in defining quality it is necessary to specify the class of wheat and the use to be made of it.

The hard red spring and hard red winter wheats are used principally for bread making. In a commercial sample of a standard variety,

bread-baking quality is associated with dark, hard, and vitreous kernels, high test weight, and high protein content. High protein content usually is associated with gluten quality and a large volume of loaf.

The soft red winter wheats and the white wheats are mostly used for family baking flours and for commercial pastry, crackers, and cereal breakfast foods. High protein content in these wheats is more often a disadvantage than an advantage. Wheat with large, plump, soft, starchy kernels producing a low-protein flour is preferred.

Durum wheat is used largely in the manufacture of semolina from which macaroni, spaghetti, noodles, and other pastes are made. Wheat with plump kernels, a bright amber color, and high protein content is desired.

There has been a tendency to measure the quality of all new wheats on the basis of their bread-making value, no matter what the market requirement of the region where they are grown. This is unfortunate and should be avoided. Quality should be defined solely on the basis of use.

New Varieties

New varieties of wheat are continually being produced by public and private workers. The older varieties were all developed and distributed by farmers or seedsmen. Since the organization of the United States Department of Agriculture and the State agricultural experiment stations the improvement of crop varieties by selection and hybridization has been an important part of the work of these agencies. New varieties from any source are tested in comparison with the old, and definite information on the best variety for any locality is obtained.

When wheat is marketed it is graded in one of the five commercial classes, viz: (1) Hard red spring, (2) durum, (3) hard red winter, (4) soft red winter, and (5) white. The variety chosen for growing in any area should preferably belong to the predominating market class of that area.

In the hard red spring wheat area of the North Central States Marquis is the most widely grown variety. It is of excellent quality and under favorable conditions yields well. It is susceptible to stem rust, however, and in the eastern section of the area, where rust is serious, is being replaced by Ceres and other resistant varieties. Ceres, a new variety developed at the North Dakota station, also yields well under favorable conditions and is good in quality. In addition it is resistant to both stem rust and drought injury, and because of these qualities is becoming widely grown. It usually outyields Marquis, especially in the eastern section where rust frequently reduces the crop. It is susceptible to smut. Other rust-resistant varieties less widely adapted are Marquillo, Progress, Hope, and Komar. Marquillo is a short, stiff-strawed variety best adapted to the more humid sections and heavier soils of Minnesota. Progress is adapted to Wisconsin, but its yield and quality are poor in the States to the westward. Komar is just being distributed in Iowa. It is a sister selection of Ceres and may have even wider adaptation. It outyields Ceres but has weaker straw. Hope wheat, developed in South Dakota, is nearly immune from stem rust. It, however, is sometimes injured by spring frosts and very often by heat and strong winds near maturity. This frequently reduces its yield and test weight per bushel. It has been grown with any degree of success only in the lake section of northeastern South Dakota, where rust is prevalent and where drought and heat

occur less frequently. Farther east in northern Illinois and Indiana and in southern Wisconsin, Illinois No. 1 is well adapted. It is particularly well suited to this section because of its resistance to scab.

In the higher and drier areas of the western Dakotas, Reward, an early-maturing high-quality wheat, is grown in some sections. Under the most favorable conditions yields of Reward are comparatively low, but its early maturity brings it safely through in marginal sections, and it also is useful for extending the harvesting period. In some of the drier sections of Montana the Supreme variety is preferred to Marquis by many growers because of slightly earlier maturity and higher yields. Under irrigation in Montana and western South Dakota, Champlain and Reliance outyield Marquis and Ceres.

The durum wheats are grown principally in eastern North Dakota and South Dakota and occupy a part of the same territory in which the hard red spring wheats are grown. Kubanka is the best known and most widely adapted variety. It is high yielding, somewhat resistant to rust, of good milling quality, and well suited to making both macaroni and bread. Mindum is the most productive durum variety in Minnesota and northeastern North Dakota and is somewhat resistant to rust. Macaroni made from Mindum is of the best quality. Pentad, a red-kerneled variety, is more resistant to stem rust than any other durum. For this reason it is extensively grown, especially from late seeding. Macaroni made from Pentad is very gray, and the market value of Pentad is low, as it is not used by edible-paste manufacturers. Other rust-resistant and productive varieties, but of poorer quality than Mindum and Kubanka, are Nodak, Monad, and Acme.

The hard red winter wheats are grown chiefly in the central and southern sections of the Great Plains region. Turkey, Blackhull, and Kanred are standard varieties. Turkey, the most widely grown winter wheat, is a good yielder and has very good quality. Blackhull outyields Turkey in the southern part of the hard winter wheat belt, but is not winter hardy and is somewhat lacking in quality. Kanred is similar to Turkey except that it is slightly more winter hardy and a higher yielder. However, it has relatively weak straw. Tenmarq is an early high-quality variety adapted best to the southern section of the hard red winter area. Quivira, recently produced at the Kansas station, is even earlier than Tenmarq. Both Tenmarq and Quivira are similar to Blackhull in lacking winter hardiness. Experiments indicate that Quivira should be well adapted in southern Kansas and in Oklahoma and Texas. In northern Kansas and Nebraska the most promising varieties are Nebraska No. 60 and Cheyenne. Nebraska No. 60 is more winter hardy and later than Turkey. Cheyenne, a new variety just being distributed by the Nebraska station, has very stiff straw and erect heads and is a desirable wheat for combine harvesting. For the more eastern part of the Central States the principal new varieties include Iobred, a high-yielding variety in Iowa, Ilred in Illinois, and Michikof, a hardy stiff-strawed variety for Indiana. Winter-hardy wheats for the northern area are Minturki, a hardy, smut-resistant, rust-resistant variety adapted in Minnesota, and Karmont and Newturk, both high-yielding winter-hardy varieties in Montana. Yogo, now being tested on farms for the first time, is winter hardy, resistant to smut, and high-yielding. In the Intermountain and Pacific Northwest States bunt is a serious problem, and Ridit and Oro are the best resistant varieties of the hard red winter class.

Common white wheats are grown mostly in the Western States, especially in Oregon, Washington, Idaho, and California, and to a less extent in two Eastern States, Michigan and New York. Goldcoin, under many names, is the most widely distributed variety of the class. It is a high-yielding variety in Michigan and New York, where it gives good yields and meets a special market demand. In the Pacific Northwest, where it is called Fortyfold, it is grown chiefly in the foothill areas, as it is susceptible to shattering in the drier, more windy sections. Federation, introduced by the United States Department of Agriculture and distributed in 1920, is now grown on a larger acreage than any other variety of white wheat.

The grain of Federation grades in the soft white subclass. It is a very productive variety grown from fall seeding in Umatilla County, Oreg., and south of the Snake River in Washington, where winters are mild. Federation also is a very productive variety from spring seeding in the more favorable sections of eastern Oregon and Washington. Under irrigation in southern Idaho, Federation is also very productive. It yields slightly more than Dicklow and is much more resistant to lodging because of its short, stiff straw. Flour made from Federation is not so white as that made from Dicklow, and some millers prefer the latter.

The bearded spring variety Baart is grown extensively in the drier areas of eastern Washington, where it has largely replaced Pacific Bluestem. Grown in this Big Bend section, Baart has high bread-making quality. It usually grades hard white and commands a premium on the market. Dicklow is grown under irrigation in southern Idaho and Utah. It grades soft white and often brings a premium over other varieties of this subclass.

Among the club varieties Hybrid 128 is most extensively grown. It is a high-yielding variety adapted to the Palouse area of eastern Washington and northern Idaho, but is very susceptible to bunt. Hybrid 128 is being partly replaced by Albit in the more productive areas of the Palouse because of the latter's resistance to some forms of smut. Albit is not, however, adapted to the lighter-rainfall areas where much Hybrid 128 is grown.

The soft red winter wheats are grown principally in the eastern half of the United States. Fultz and Fulcaster are the standard and most widely grown varieties. The leading new varieties are Trumbull and Fulhio in Ohio, Red Rock and Bald Rock in Michigan, Purkof in Indiana, Nittany in Pennsylvania, Forward in New York, Gasta in Georgia, Ashland in Kentucky, Denton in Texas, and Kawvale in Kansas. All of these do well in the sections where they have been developed.

S. C. Salmon, *Bureau of Plant Industry.*

WHEAT'S Rotation Use Is Largely Determined by Crop Competition The United States has never, with the possible exception of a short time during the World War, been under the compulsion of making its acres produce as much wheat as possible in order to provide bread for its own inhabitants or to meet the demands of its customers in the markets of the world. Consequently, in adopting rotations and cultural practices,

its farmers have been free to consider immediate and ultimate profit without regard to the total production of foodstuffs from their acres.

Wheat has a wide margin of adaptation to soil and cultural conditions. Its chief requirements are a compact seed bed containing sufficient moisture to germinate the seed and maintain growth, and providing a fairly abundant supply of nitrates. These conditions may be supplied by such a wide range of crop-sequence and cultivation methods that the place of wheat in the rotation and its relative importance in the cropping system is dependent to a large extent upon the competition of other crops. Few soils are too fertile to grow wheat successfully, but on rich soils abundantly supplied with moisture the competition of other crops may prevent the growth of wheat entirely or force it into a position where it is grown not so much for itself as for the sake of the other crops in the rotation.

The quality of hard red wheat, either winter or spring, is measured largely by the percentage of protein it contains. This content is materially affected by the quantity of nitrates in the soil. This factor, however, strengthens rather than decreases the desirability of practicing the best rotation systems and tillage methods, because in general the treatments that produce the largest quantity of nitrates in the soil also produce the largest yields of wheat and the highest percentages of protein.

Rotations and Tillage Methods

In point of potential or possible acreage, corn is the chief competitor of wheat in the farming system. Over extensive areas in the United States to which wheat is adapted corn, grasses, and livestock make up the most profitable farming system, but at least one small grain is necessary for seeding the land to a sod crop. Under normal conditions, wheat is the high-profit crop for this purpose in many sections, but its place in the rotation is determined either by the mechanics of cultural operations or by the relative acre values of other small grains. In Maryland, Pennsylvania, and parts of the Corn Belt, where the corn is cut and shocked or removed for silage, winter wheat may follow the corn directly. When this is the sequence, the ground is prepared by a relatively shallow cultivation with some form of the disk harrow or the spring-tooth harrow. In what is perhaps a more common form of this rotation a crop of oats is grown between the corn and the wheat.

A comparatively small acreage of winter wheat is seeded in standing corn with 5-row drills. This practice is more common near the northern and western edges of the corn and winter-wheat belt where the standing cornstalks provide a desirable protection against winterkilling and in very sandy soil where they provide protection against soil blowing during the winter and spring.

In the tall-growing corn of the Corn Belt, it is practically impossible to depend over a long period on seeding wheat in standing corn. Nor is it desirable to sow in the cornstalks, on account of the likelihood of scab infection from the cornstalks. The more usual practice is to grow a spring-sown crop such as oats, barley, or soybeans, between the corn and the wheat. Following these crops the land is prepared for wheat by plowing it as early as possible in order to prepare a clean, firm seed bed and promote the development of nitrates.

Basic Rotation Very Elastic

The basic 3-course rotation of corn, wheat or other small grain, and sod is very elastic and may be modified to meet the requirements of the farm organization, the relative crop adaptations of a locality, or the current set-up of prices for different farm products. Two or more crops of corn may be grown in succession, or the number of years in small grain or sod may be increased. Potatoes or other cultivated crops may take the place of corn. The rotation should contain a legume; this may be clover, sweetclover, or alfalfa; or these may be replaced by such annuals as soybeans or cowpeas; or the rotation may be extended to include an annual legume as well as a sod crop.

With decreasing rainfall nearer the Great Plains, the tendency is to increase the acreage of wheat at the expense of corn, more wheat is grown after wheat, and the sod crop has a small place in the rotation.

In the central and southern Great Plains the adaptation of wheat to large-scale farming, which is synonymous with low acre cost, and its normally greater acre value in comparison with other crops, simplifies the rotation. Where 75 per cent or more of the cultivated acreage is in winter wheat, much of the wheat must follow wheat. The sod crop disappears from the rotation because of its lack of adaptation. Fallow enters into the rotation to a degree that depends on the deficiency of rainfall. Wheat and fallow may alternate every other year, two crops of wheat may follow the fallow, or wheat may be raised more or less continuously. When wheat follows wheat or another small grain, it is essential that plowing or other cultivation start as early as possible. The 1-way disk plow is extensively used for cheap and rapid cultivation of stubble land. Listing and leveling by later cultivation is also a cheap and very efficient means of preparation. On land that is free from weeds winter wheat may be sown in uncultivated wheat stubble with satisfactory results. Corn, beans, and cowpeas are generally followed by wheat. South from about central Kansas the sorghums are important crops. Winter wheat does not do well after them. A fallow, or spring-sown barley or oats, is often introduced between the sorghums and the wheat crop.

In Oklahoma and Texas, where winter wheat and cotton are grown, it is feasible to sow wheat following cotton without cultivation, but better yields are obtained if the cotton is followed with winter-sown oats. Cultivation of the oat stubble can begin early enough to prepare a very favorable seed bed for wheat.

In Iowa, southeastern South Dakota, southern Minnesota, and Wisconsin, the northern limit of winter wheat and the southern limit of spring wheat on the western prairies, wheat has not been able to stand the competition of other crops. When raised in this section, it generally follows corn or some other cultivated crop without plowing, except where the corn is removed too late to seed winter wheat. In such cases the rotation becomes corn, oats, and wheat.

In the spring-wheat area of Montana, the Dakotas, and Minnesota, the rotation ranges from continuous wheat with more or less fallow in the drier western part, through a sequence of corn, wheat, and oats or barley, to the more highly developed rotation, including a sod crop, in the more humid section. Clover, timothy, sweetclover, and bromegrass are the principal sod crops. When wheat follows wheat or another small grain, the short spring and the necessity for early seeding requires that most of the plowing be done in the fall, although spring

plowing may produce slightly greater yields. Corn ground is usually disked in preparation for wheat or other small grain. In the drier section a 4-course rotation of corn, oats or barley, fallow, and wheat is coming into considerable favor.

In those parts of the intermountain plateau area suited for dry farming the greater part of the rainfall comes during the winter, and the rotation is an alternation of winter wheat and fallow. The land is plowed for fallow early in the spring.

In the Columbia and Snake River Basins where the annual rainfall is from 9 to 14 inches, the fallow is an almost universal preparation for wheat. Where the rainfall is heavier, two crops may follow a fallow or wheat may be grown continuously. The substitution of suitable crop rotations would be desirable in maintaining soil fertility, distributing labor, and distributing the risk of failure, but is retarded by the lack of crops that are as productive as small grains under the limited rainfall. Sweetclover holds much promise as a rotation crop in the small-grain and fallow system, where rainfall warrants.

Time of Seeding

In practically all regions spring wheat should be sown as early as soil and weather will permit getting the seed into the ground in such a condition that germination will take place promptly. This usually means seeding as soon as the frost is out of the ground and the land can be prepared.

For winter wheat the situation is very different. Very early seeding of winter wheat may invite losses from winterkilling, Hessian fly, stinking smut (bunt), and certain foot rots, whereas very late seeding may result in winterkilling, a slow, weakly growth in the spring, late maturity, and low yields. The best time to seed depends so much on local and seasonal conditions that no general rule governing it can be given. In the eastern half of the United States, the Hessian fly often dominates all other factors, and the time of seeding is, therefore, largely determined by the prevalence of this insect. When the fly is so numerous as to constitute a major threat, seeding should not be done until after the so-called "fly-free" or "fly-safe" date. This date for each principal wheat-growing locality has been determined by careful experimental plantings for many years. It is the earliest date on which winter wheat can be sown with a reasonable assurance of no losses from the Hessian fly.

As a general rule, the fly-safe or fly-free dates of seeding are slightly too late for the best yields. Hence if Hessian flies are not present or if damage is not likely to occur, it may be desirable to seed a week or 10 days earlier than these dates. It will be particularly desirable to do so if there is a large acreage to seed and consequent possibility of serious delays because of bad weather.

The date of seeding is known to have a very definite relation to winter survival. If wheat is sown so early that jointing takes place in the fall, winter injury is very likely to occur. If, on the other hand, seeding is very late, the plants may be very small when winter sets in and therefore be unable to survive. This latter trouble is especially likely to occur in the Eastern States where heaving is a common cause of winter injury. For average conditions in the Great Plains a satisfactory date for seeding winter wheat, in so far as winter survival is concerned, is early enough to permit the formation before winter of five to

eight tillers per plant with the growth more or less flat on the ground. Somewhat earlier seeding and somewhat more growth may often be desirable in the eastern part of the United States.

In semiarid areas there is often a temptation to seed in dry soil and depend on later rains to bring up the crop. This usually is not a satisfactory method, because a small rain may germinate the seed but be insufficient to maintain the young plants until additional rains occur. Also, in some cases, false wireworms are likely to attack the grain in the dry soil and destroy it before it can germinate. It is usually a better plan to have machinery and seed ready and to seed promptly after rain falls in sufficient quantity to germinate the seed and maintain the plants for a reasonable time.

In recent years it has been found that late seeding tends to reduce damage from stinking smut (bunt) and Helminthosporium foot rot. The protection from bunt alone can scarcely be considered a valid argument for late seeding in those areas where this disease can be prevented by seed treatment, because the cost of treatment is much less than the probable loss from late seeding. This relation, however, does afford a satisfactory explanation for the variations in damage from bunt that occur from year to year and from field to field. Late seeding may be favorably considered as a protective measure against the foot rot in certain regions where the disease causes serious damage.

Rate of Seeding

Although, in general, the rate of seeding has much less effect than other factors on the resulting crop, it nevertheless merits consideration. The best rate depends on several factors, the most important of which are the kind or variety of wheat, the rainfall of the region, the time of seeding, the soil, and the preparation of the ground.

Spring wheat ordinarily tillers less than winter wheat, and under comparable conditions 1 or 2 pecks more seed per acre is usually sown. There are, also, variations in tillering among varieties of the same class or kind of wheat, and differences in the size of the seed, which theoretically should influence the rate of seeding. Generally speaking, these items are not of sufficient importance to modify farm practice materially.

The rate of seeding is generally greater in regions of high rainfall, on rich soil, and on well-prepared land. An exception may be made when land is so poorly prepared that only a part of the seed will germinate; an additional quantity is then needed. Seed that is suspected or known to be deficient in viability is planted at a rate higher than normal. Such exceptions are not common.

The rates of seeding that may be expected to give the best yields in the eastern part of the United States range from 6 to 8 pecks per acre. In the Great Plains from 4 to 6 pecks per acre for winter wheat and common spring wheat and from 5 to 7 pecks per acre for durum spring wheat may in general be recommended. In the Pacific Northwest the rate of seeding commonly ranges from 3 to 6 pecks, depending on the kind of wheat that is grown and the rainfall in the locality.

It is commonly believed that in dry regions a very low rate of seeding, 1 to 3 pecks per acre, gives better yields than higher rates. Numerous experiments have shown rather conclusively that this is not generally true. Such rates do occasionally give higher yields in very

dry seasons, but, generally speaking, the average yields are no higher and frequently are lower than those for somewhat heavier rates. Better stands tend to reduce weed infestation and also reduce likelihood of serious damage from wireworms, winterkilling, and soil blowing. The additional seed is usually good insurance and does not reduce average yields on well-prepared ground even in the driest years.

The time of seeding winter wheat may affect the rate of seeding, late seeding under some conditions requiring from 1 to 2 pecks more seed per acre than seeding done at the most favorable time. In the spring-wheat belt the rate of seeding is also related to the method of seeding. In this area some wheat is sown broadcast, and it is generally considered desirable to seed about 1 peck more per acre than if sowing with a drill.

Methods of Seeding

Wheat is usually sown broadcast or with a drill. Broadcasting is a more rapid and cheaper method, but the yields secured thereby are less than those obtained by drilling.

In recent years some winter wheat in Montana, western Kansas, western Nebraska, and eastern Colorado has been sown with furrow drills, the grain being placed at the bottom of furrows 4 to 5 inches deep and 12 to 14 inches apart. Wheat planted in this way is protected during the winter and early spring against winterkilling and soil blowing. In Montana and eastern Colorado especially, yields have been materially increased by this practice.

JOHN S. COLE *and* S. C. SALMON, *Bureau of Plant Industry.*

WHEAT Does Best in Well-Drained, Fertile Loams; Responds to Fertilizer

The best soils for wheat are fertile well-drained loams, silt loams, clay loams, and clays, having an ample supply of humus or decaying organic matter and a rather heavy but well-drained subsoil. Such soils possess a high water-holding capacity, a characteristic favorable to satisfactory wheat production. Good drainage is essential, as excess rainfall may cause water-logging of the soil, which frequently proves to be a very serious factor against obtaining a full stand of wheat.

Heavy, poorly-drained soils with impervious subsoils do not make good wheat soils, because of the slow removal of water and the consequent poor air circulation in the soil. On such soils wheat is often severely injured, if not killed, by standing water during the growing season or smothered by the surplus water freezing in the soil during the winter. Winter cereals in general are much more easily winterkilled in low, poorly drained lands because of alternate freezing and thawing that causes heaving of the soil. On low lands lodging is generally more prevalent than on upland soils, and to some extent cereal diseases appear to be more common, because of inadequate drainage and reduced air circulation.

Soils lighter in texture than loams, such as sands and sandy loams, may produce good crops of wheat at times, but there is more uncertainty about the yield, because such soils retain less rainfall than the heavier types and dry out more quickly, so that when rainfall is deficient the crop suffers more. This factor is rendered more serious if the subsoil is open and the return of moisture to the surface soil through

capillary action is retarded during droughty spells. The lighter soils, those coarser than loam in texture, are better adapted to corn, sorghums, legumes, and vegetable crops. Rye and oats, among the small cereal grains, will do better than wheat on poor soils, and rye will give better returns on sandy soils having an acid reaction. Wheat, on the contrary, prefers and does best on a soil nearly neutral in reaction, although is it somewhat tolerant to a mild degree of acidity.

Soil types preeminently suited for wheat production occur in many parts of the United States, their location and extent having been determined through soil surveys conducted by the Bureau of Chemistry and Soils, United States Department of Agriculture, in cooperation with the different States. Such surveys produce much valuable information on the physical characteristics and productivity of good wheat soils. It is not necessary here to enumerate and describe important soil types on which wheat is produced, as complete descriptions and maps showing their extent are in available soil survey reports.

Fertilizers

Wheat responds well to fertilizer treatment, and in the older wheat-growing regions, particularly east of the Mississippi River, the results of experimental trials and of general experience show that this response is quite generally profitable in both yield and quality of wheat produced. In the wheat region west of the Mississippi, the adoption of the use of fertilizers other than barnyard manure and green-manure crops, has been relatively slow. This has been true in part, no doubt, because of the greater inherent richness of the soil in that region, which naturally provided a more balanced plant-food ration. An additional reason for the relatively slow introduction of fertilizers into the less humid areas may well be the fact that in many of these areas lack of sufficient rainfall is often a limiting factor. Where soil moisture is lacking, fertilizer effectiveness drops to the extent of that lack. While succeeding crops of wheat are removed year after year, there is nevertheless some evidence that wheat and other crops on some of the important soil types of the Middle West are beginning to respond favorably to one or more of the plant-food elements, nitrogen, phosphorus, or potassium, chiefly phosphorus.

The proper fertilizer practice for wheat production depends upon the kind of soil, whether the soil is light or heavy, the system of farming, previous treatment, whether manure is available, and whether a seeding is to be made in the wheat in the spring. The most economical use of fertilizer in wheat production is made only when a suitable crop rotation is practiced and the soil maintained in good physical condition. Long-time experiments in Pennsylvania, Ohio, New York, and Massachusetts have shown that wheat yields can be profitably maintained by proper selection of plant-food mixtures in connection with a system of crop rotation.

Three main methods of furnishing plant food to the wheat crop are (1) the application of manure, (2) growing and plowing down green-manure crops or crop residues, and (3) the use of commercial fertilizers.

In one of the most common rotations in the East—corn, oats, wheat, and mixed grasses—better results are secured from manure when it is applied on the clover sod and plowed under for corn. An application of 8 to 10 tons of manure, reinforced with 50 pounds of some form of phosphate, such as ordinary superphosphate, applied to each ton of manure

in the stable or when being hauled to the field, should be made once during the rotation, generally to corn. If soils are of low to moderate fertility, well-decomposed manure may advantageously be applied to the wheat crop as a top-dressing before or after seeding, rather than plowing the manure under. The leaching action of rain will carry the soluble plant food into the soil, and the strawy residue will serve as a mulch during cold weather. This method is not advisable on land which is too rolling. Fresh, coarse manure should not be used, as it tends to cause too rank a growth with consequent danger of lodging. Such manure is best applied to crops that precede wheat.

Green-Manure Crops

Green-manure crops, such as the clovers, alfalfa, cowpeas, soybeans, rye, and other equally important humus-building crops, and various crop residues when properly plowed under, augment the supply of humus, increase the water-holding capacity of the soil, improve tilth, furnish much-needed nitrogen and mineral plant-food compounds, aid in making the plant food in the soil available, and prevent plant food from leaching too rapidly from the soil. When barnyard manure is not to be had and no provision is made to incorporate crop residues with the soil, the growing and turning under of green-manure crops is essential in order to aid in maintaining soil organic matter, an all-important factor in establishing high soil fertility.

Commercial fertilizers recommended for wheat are predominantly phosphatic in composition and as a rule carry comparatively small amounts of nitrogen and potassium. On land where manure has been applied at frequent intervals or when leguminous crops have been utilized in the rotation, it is practicable to use a complete fertilizer containing relatively small amounts of nitrogen and potassium, but having a high phosphorus content. Otherwise, a complete fertilizer with a greater proportion of nitrogen and potassium is indicated. If barnyard manure is plowed under for wheat, particularly on heavy soil, superphosphate alone in a fall application is frequently recommended. If wheat production is attempted on light soils, or on soils comparatively low in fertility, a complete fertilizer containing more nitrogen and potash than would be called for on heavy soils or on soils recently manured, should be used. If manure has been applied, less fertilizer is required. In general, wheat grown in rotation receives fertilizer alone, the manure having been applied to a crop preceding the wheat.

A suitable fertilizer analysis for wheat depends upon a number of factors, chiefly the character of the soil and the system of farming. Rather a wide range of fertilizer analyses can be recommended for wheat, but in general they are, as previously indicated, high in phosphoric acid. Complete fertilizer analyses recommended for wheat generally carry from 2 to 4 per cent of nitrogen, 10 to 20 per cent of phosphoric acid, and 2 to 8 per cent of potash. Analyses like 2–12–6, 2–10–8, 2–16–2, 4–12–4, or 4–16–4 are commonly used. The selection of an analysis and determination of the amount to apply should be based upon the results of fertilizer trials, observation, and the practical experience of wheat growers.

The kind and amount of fertilizer to apply to wheat will necessarily vary in accordance with the soil conditions, previous treatment, and other factors associated with the type of farming followed. To obtain economical results in fertilizing the wheat crop, due attention should

be paid to the saving and utilization of all available supplies of manure as well as legume crops and other crop residues. The rate of application of fertilizer for wheat will rarely exceed 500 pounds to the acre, the average probably being nearer 200 pounds. On account of the money value of wheat, moderate rates of application have generally proved more profitable than heavier rates.

Methods of Applying Fertilizer

The best method of applying fertilizer for wheat is to use a grain drill with a fertilizer attachment at time of seeding, which makes for uniformity of distribution and proper placement of the fertilizer in reference to the seed. If no fertilizer attachment to the grain drill is available, some method of broadcasting the fertilizer ahead of seeding is necessary. If the soil is in need of lime, a lime distributor may be used to advantage, or the grain drill with fertilizer attachment may be used to apply the lime. Applications of lime are usually made to a crop planted ahead of wheat.

The importance of taking measures to provide quickly available nitrogen compounds in wheat production is well recognized, particularly the practice of making light spring applications on wheat that has not wintered well. Nitrate of soda, because of its immediate availability, is most often used, ordinarily at the rate of from 50 to 100 pounds to the acre. It is best applied as a top-dressing very soon after growth starts in the spring. It is recognized that an ample supply of quickly available nitrogen is helpful in the production of protein in the wheat. The use of fertilizer is also an advantage when seeding is done late to avoid Hessian fly injury, as fertilized wheat will make a much better growth before winter sets in and will develop a heavier root system and more vigorous growth in the spring than will either unfertilized or underfertilized wheat.

From an economic standpoint, proper fertilization of the wheat crop increases the acre yield and thus reduces the unit cost per bushel, a matter of considerable importance to wheat growers at all times, but more especially when prices for wheat are abnormally low.

B. E. Brown, *Bureau of Chemistry and Soils.*

WHEAT Is Attacked by Rusts, Smuts, and Other Destructive Diseases Wheat is subject to many pests and parasites, both plant and animal. Among the plant parasites are numerous fungi and bacteria that cause well-known and often highly destructive diseases. Chief among these are the smuts, the rusts, scab, take-all, foot rots, and mosaic. Occasionally two or more diseases, accompanied by one or more insect pests, prey upon the wheat crop epidemically and at the same time.

The Rusts

Wheat in the United States is attacked by three rusts: Stem rust (*Puccinia graminis tritici*), so named because it is confined mostly to the stem and leaf sheath; leaf rust (*P. triticina*), most generally confined to the leaves; and stripe rust (*P. glumarum tritici*), present chiefly on the leaves and glumes. These three rusts are not all of equal economic importance nor are they equally widespread geographically.

Stem rust requires, in addition to wheat, another host, the common barberry, on which to complete its life cycle. In the extreme Southern States and along the Pacific coast it survives the winter on wheat and related perennial grasses. It does not depend upon the barberry for its continued propagation in those States. Where the winters are severe or are characterized by abrupt changes from very low to relatively high temperatures, stem rust rarely survives except in the winter-spore (teliospore) stage. Leaf rust and stripe rust, on the other hand, are winter hardy and are able to survive as fungus mycelium within the leaf tissue of the successfully overwintered wheat plants.

The spread of stem rust throughout the great wheat-producing States all the way from Texas to Canada may be and often is partly due to the gradual northward movement of spores successively from Texas to Oklahoma, Kansas, Nebraska, the Dakotas, and other Northern States. This northward march of rust depends on the winter survival of rust in the South and on favorable spring weather and does not always occur. Probably the most prolific and dependable spreader of stem rust from Kansas northward is the common barberry. There is abundant and unquestionable evidence that rust may spread from barberry bushes to near-by grain fields and thence to those at greater and greater distances. Given optimum weather conditions and an abundance of rust spores from the South or from the barberry, it needs only a few weeks for stem rust to cover a vast territory, with great damage to the crop. In 1916 this rust caused a loss estimated at 180,000,000 bushels of wheat in Minnesota, the Dakotas, and Montana.

Leaf rust also is the cause of large annual losses. Under favorable fall weather conditions leaf rust may gain great headway. If favored by a mild winter or an ample continuous snow cover followed by optimum growing conditions in the spring, it may become so severe as to prevent the crop from heading. This rarely happens, but in any year there is always a considerable loss in yield, often not recognized because the rust does not cause shriveled grain.

Stripe rust, at present confined to the Pacific Coast and Western Mountain States, has not been serious in wheat production in the United States, except occasionally in limited local areas. It is, however, a very serious factor in Europe, and might become so in this country if it spread to the great wheat-producing States of the Mississippi Valley.

Control of Rusts

During the last 25 years much attention has been devoted to the control of cereal rusts. Chemical sprays are of no practical value. It has been shown conclusively that rusts can be controlled by applying sulphur dust twice a week or oftener, but this is too costly and laborious to be profitable.

As has already been stated, the barberry is an important agent in the spread of stem rust, particularly in the spring-wheat States. Not only are countless millions of rust spores produced every spring on the barberry bushes, but new forms of rust may develop by hybridization between different forms or between different varieties of rust on these same infected barberries. These facts emphasize the importance of controlling stem rust by exterminating the barberries. Millions of the bushes in the North Central States have been destroyed in the cooperative eradication campaign conducted by the Bureau of Plant Industry and the States. Already a marked decrease in the annual loss from

stem rust has been recorded. An important part of this decrease is due to reducing the number of barberry bushes.

Not only is the barberry being eradicated, but varieties of wheat resistant to the rusts are being developed by breeding and selection.

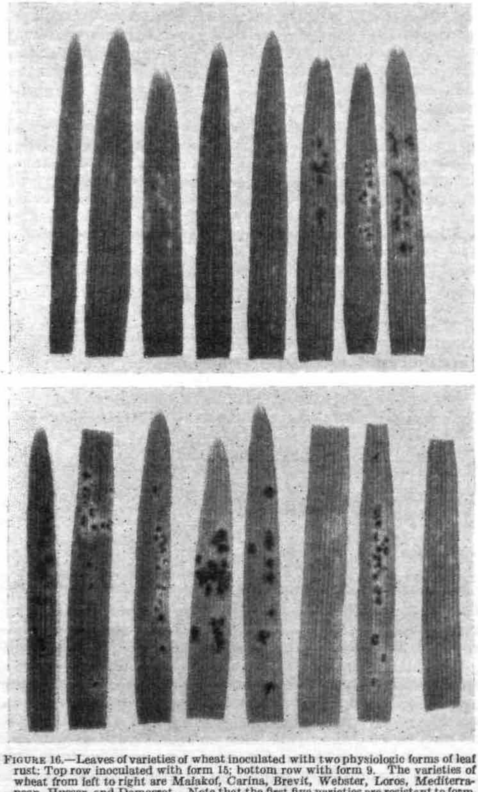


FIGURE 16.—Leaves of varieties of wheat inoculated with two physiologic forms of leaf rust: Top row inoculated with form 15; bottom row with form 9. The varieties of wheat from left to right are Malakof, Carina, Brevit, Webster, Loros, Mediterranean, Hussar, and Democrat. Note that the first five varieties are resistant to form 15 (top row) and susceptible to form 9 (bottom row), whereas Mediterranean and Democrat are susceptible to form 15 and resistant to form 9. Hussar is moderately *susceptible to both forms*

(Fig. 16.) Among the many known varieties of wheat a few are resistant to one or other of the rusts, a smaller number being resistant to all three. Such resistant wheats are crossed with other commercial varieties, and from the hybrid progenies those types combining disease

resistance and other desirable qualities are selected. Some progress has been made in this direction. Rust-resistant varieties of spring wheat such as Ceres, Marquillo, and Hope have been developed and are now being grown on farms. It is estimated that about 5,000,000 acres of Ceres were grown in 1932, its rapid spread since its introduction in 1926 being largely because of its resistance to stem rust. Crosses between Hope and H–44, a sister selection (both nearly immune from rust in the field), and other varieties are giving strains that promise high resistance to stem and leaf rusts and possess other satisfactory qualities. The problem is not easy, however, since there are strains of the rusts capable of attacking even varieties of wheat highly resistant to other rust strains. These rust strains, differing in virulence on different varieties, are called physiologic forms. Fortunately, however, varieties of wheat like Hope and H–44 are resistant to large numbers of these forms, and so also are their hybrids.

Among the winter wheats, the Kanred variety has been consistently resistant to certain physiologic forms of stem rust. Other varieties, such as Tenmarq and Minhardi, have shown some resistance to stem rust in experimental plantings in the Eastern States.

Also a number of varieties and strains of both winter and spring wheat that are resistant to leaf rust have been found. These are being *extensively grown in experimental tests, and there is good reason to* believe that some of them, either themselves or as parents, will eventually produce varieties that are not only resistant to this disease but also satisfactory in other respects and adapted to different parts of the United States.

Wheat Smuts

Four kinds of smut attack wheat in the United States—two kinds of stinking smut (bunt), loose smut, and flag smut. The stinking smuts and loose smut are widely distributed in all wheat-growing areas of the country. Flag smut is known to occur only in a limited territory along the Mississippi River in Illinois and Missouri, in the neighborhood of St. Louis, and along the Missouri River in Kansas and Missouri, near Kansas City, and Leavenworth, Kans.

The two stinking smuts caused annual losses in the United States during the 11-year period 1920–1930 that were estimated at over 25,000,000 bushels. These losses appear to be increasing. (Fig. 17.)

Fortunately, stinking smut can be controlled in most regions by simple and inexpensive seed treatments. In the Pacific Northwest and in certain intermountain valleys of the Great Basin in Utah and southern Idaho, seed treatment is ineffective. Here the soil becomes infested with the smut spores, which remain alive long enough to infect the following crop. In most areas the spores that produce the smut are carried on the seed and it is only necessary to treat the seed in such a manner that these spores are killed and the seed itself is not injured. It was discovered many years ago that this could be done by wetting the seed with a solution of bluestone (copper sulphate) or formaldehyde. One disadvantage is that the seed must be dried again if it is not planted immediately, and if it is sown at once the seeding rate must be increased to allow for swelling. Within recent years several dust treatments that avoid these difficulties have been developed. One of the most effective is the use of copper carbonate, a very finely powdered dust prepared especially for treating seed. It may be applied

to wheat well in advance of seeding and the seed may be stored without injury until used. It is cheap and easy to apply and protects the seed from weevils as well as from stinking smut. Rats and mice prefer untreated to treated grain, and this treatment affords some protection against these rodents.

In the intermountain region and the Pacific Northwest a certain degree of control has been secured through the use of resistant varieties. Thousands of acres of two bunt-resistant varieties, Ridit and Albit, produced cooperatively at the Washington Agricultural Experiment Station, are now grown in the Pacific Northwest and without doubt have materially reduced the losses that would otherwise have resulted. Oro, a bunt-resistant hard winter wheat produced in cooperative experiments in Oregon, is grown on a commercial scale in southern Idaho.

As with the rusts, the control of smuts by breeding resistant varieties is made more difficult by the presence of physiologic forms of smut, which may be similar in appearance but very different in their effect on different varieties of wheat. About a dozen such forms have been

FIGURE 17.—Bunt or stinking smut in a field of hard red winter wheat in Utah. All the short plants have bunt and produced no grain. About 90 per cent of the plants in this picture are about 62 per cent of the plants in the 80-acre field from which it was taken were bunted

discovered. This means that a variety of wheat that is resistant in one region is not necessarily resistant in another, since a different form of the smut parasite may be present in the latter. Also it may mean that a variety that is resistant this year may not be resistant next year because new forms of smut not before present in the locality may have been introduced and allowed to multiply. To avoid the latter contingency, it seems desirable to continue seed treatments even though varieties resistant to the known races of stinking smuts are grown. The copper carbonate dust treatment is simple and so relatively inexpensive that it may be used profitably as an insurance against smut damage, even though losses do not appear imminent.

The loose smut of wheat is well known to wheat farmers in the more humid sections of the United States and in arid areas where the crop is grown under irrigation. It is not common on dry land. Since the fungus that cause the disease are located inside the seed, the ordinary seed treatments for stinking smut or bunt are not effective against loose smut. It has been found, however, that the disease can be con-

trolled without serious injury to the wheat by subjecting the latter to a temperature of 129° F. for 10 minutes in water, following a 4-hour presoak in cold water. This treatment is rather difficult to apply and is not practical for large quantities of seed. The common practice, therefore, has been to treat enough seed only for a seed plot from which seed for general planting is obtained the following year. This seed plot should be well isolated from fields of wheat that are infected with loose smut, since the spores will blow from the infected wheat and reinfect the seed plot.

Some progress has been made in determining the loose-smut resistance of wheat varieties in order to avoid the work and expense of treatment. Among commercial varieties resistant to this disease are Blackhull, Ridit, Forward, Marvelous (a selection of Fulcaster), Leap, Purplestraw, Trumbull, and Wyandotte.

Flag smut, found for the first time in the United States in 1918, has been confined to certain localities in Illinois, Missouri, and Kansas by quarantine, crop rotation, seed treatment, and the use of resistant varieties. The use of resistant varieties is the most promising method of control in the area where the disease occurs. Among varieties resistant to flag smut are Blackhull, Kanred, Turkey, Shepherd, Fulcaster, and Red May.

Wheat Scab

Wheat scab is one of the three most important diseases of wheat in the United States, particularly in the Corn Belt and eastward. Occasionally it may almost completely destroy individual fields. In the more arid western States it is of minor importance or entirely absent.

The disease is caused by a parasitic fungus (*Gibberella saubinetii*), which may be carried from one crop of wheat to the next either in or on the seed or on crop refuse on the soil. It also attacks corn, and the most severe outbreaks often occur when wheat follows corn in the rotation. The disease may attack the young wheat plants as the kernels germinate, resulting in poor stands; it may attack the lower portions of the wheat plants later in the season, weakening the plants and reducing yields; or it may attack the wheat heads, especially if rainy weather occurs when the wheat is in bloom or soon thereafter. In the latter case, the entire head or one or more spikelets in each head may be killed. The dead spikelets soon become bleached and usually show more or less salmon-pink coloration between the glumes, especially at their bases. The kernels in such spikelets are shrunken or entirely absent. The shrunken kernels are usually somewhat rough and scabby; hence the name "scab."

In areas where conditions favor the development of scab, particularly in the Corn Belt, the disease is difficult to control, especially in wet, rainy seasons. Losses may be reduced to a minimum (1) by carefully plowing under infested crop refuse, especially corn stubble; (2) by not seeding wheat after corn; (3) by cleaning the seed thoroughly and treating it with a standard fungicide; and (4) by avoiding so far as possible the use of varieties and strains of wheat that are unusually susceptible to this disease. There are strains of winter wheat resistant to scab that show promise as parents for breeding new resistant varieties. Illinois No. 1 is a spring variety highly resistant to scab, and can be grown in Illinois, northern Indiana, or southern Wisconsin.

Wheat Foot Rots

The term "foot rots" includes a number of diseases that attack the basal portions of the growing plants and cause them to disintegrate or rot. The more important of these are (1) take-all, (2) Helminthosporium foot rot, and (3) Columbia Basin foot rot. Each is caused by a specific fungus that lives in the soil from one crop to the next.

For many years take-all has been known as an important disease of wheat in a number of foreign countries, especially in Australia. It was first discovered in the United States in 1919, and is now known to occur in sections of Kansas and Oklahoma and to a slight extent in a number of other States. In the United States it attacks winter wheat only. In Canada it occurs also in spring wheat.

The disease usually destroys all of the plants in badly infested spots in affected fields. Occasionally, however, isolated plants or small groups of plants are affected.

The affected plants may be killed by the disease at various stages of their development, but usually they are approaching or are in the heading stage when they die. Usually such plants have little or no grain in them and remain erect. They can usually be pulled up rather easily because of the rotted condition of the roots.

Take-all is very difficult to control. Extensive searches for resistant varieties and strains have been made, but with discouraging results. Different fertilizer treatments also have been tried, with only moderate success. Rotation with such substantially immune crops as oats, corn, sorghum, various millets, legumes, potatoes, root crops, etc., is perhaps the most satisfactory method. Badly infested land should not be sown to wheat, barley, or rye for at least three and preferably four years.

The Helminthosporium foot rot causes great losses in both spring and winter wheat, particularly in the Great Plains and intermountain areas. The disease manifests itself as a seedling blight, especially in spring wheat, and as a foot rot later in the season. It may also attack the leaves, heads, and kernels to some extent. The causal fungus is carried in the seed as well as in the soil. The affected plants may be either killed or stunted. The affected portions usually show rather dark brown discolorations, especially at the bases of the plants.

No fully satisfactory control measures for the Helminthosporium foot rot are known. Seed treatments are not effective, because the fungus occurs inside the seed and also in the soil. Late seeding of winter wheat and early seeding of spring wheat are often effective, since growth of the fungus requires warm weather. If the wheat can establish itself well before being attacked it has a distinct advantage.

The Columbia Basin foot rot is known to occur in the United States only in Washington, Oregon, and Idaho. It also occurs in France. In some years this desease causes severe losses on certain sandy loam soils in the States mentioned. It attacks the basal portion of the culms so that they break over and lodge irregularly, and yields are greatly reduced. The bases of attacked plants are frequently covered by a black charred-looking scurf of the causal fungus.

The disease is rather difficult to control. Certain varieties of wheat such as Hybrid 128 are fairly resistant, and a certain measure of control can be effected by growing these varieties where they are adapted. Since the fungus tends to accumulate in the soil, wheat should not be grown year after year on the same land. Sowing winter wheat slightly later than usual also tends to lessen the severity of the disease.

Black Chaff

Black chaff, a bacterial disease, was discovered in the United States in 1919. It now occurs on both spring and winter wheats in a number of States. It attacks chiefly the glumes, kernels, necks, and leaves. In extreme cases, particularly in wet seasons, it may cause severe losses. In general, however, the disease is not so destructive as are many others. Control measures are difficult. No practicable seed treatments are known, nor are there any immune varieties of wheat, although some are more resistant than others. The most feasible control measure seems to be the use of seed of adapted resistant varieties from fields where the disease has not occurred.

Mosaic

Wheat mosaic (also known as wheat rosette) was found in the United States in 1919. It first made its appearance in Illinois and Indiana but has since been found in Kansas, North Carolina, and Virginia. It occurs mostly on winter wheat, but spring wheat also is susceptible.

On most varieties of wheat this disease manifests itself as a characteristic leaf mottling, but on a few varieties, especially Harvest Queen, it appears as a "rosetting" of the attacked plants. Such plants tend to remain low and to tiller excessively. They show also a characteristic dark green color. Many of them may be killed, with heavy damage to the crop.

The disease may remain alive in the soil for several years, and the only feasible way to control it is to use varieties of wheat that are resistant to it. Fortunately, there are a number of such varieties, and in nearly every region where mosaic is known to occur it is possible to choose a variety that is resistant to this disease and also satisfactory in other respects.

Nematode Disease

The nematode disease of wheat, long known in foreign countries, was first found to a limited extent in the United States in 1909, and about 10 years later caused considerable losses in Virginia and West Virginia. It has also been found in Maryland, North Carolina, South Carolina, and Georgia.

The disease is caused by a minute roundworm called a nematode, which forms galls instead of kernels in the heads. The larvae of the nematode are contained in these galls, and when sown with the wheat they come out and attack the growing wheat plants, again forming galls in the heads. Under field conditions the disease is known in the United States only on winter wheat, although spring wheat is known to be very susceptible.

Fortunately, satisfactory control measures have been developed for this disease. The nematode can overwinter only in growing plants of wheat or other susceptible grains. For complete control only two things are necessary: (1) To use seed known to be free from nematode galls, and (2) to sow it on land free from nematodes. Land that has not grown nematode-infested grain for at least a year and has had no infested straw, refuse, or manure placed on it within a year, is very certain to be nematode-free.

H. B. HUMPHREY, *Bureau of Plant Industry.*

WHEAT Is Attacked by Insects at Each Stage in Life of the Plant Every stage in the life cycle of the wheat plant is subject to insect attack. As soon as the seed grain leaves the drill, insect pests are on hand in the soil to prevent germination, and threats from different groups of insects continue throughout the entire life of the plant. Furthermore, all along the journey of the grain through the harvester and thresher, through storage, milling, and baking operations, to the very table of the consumer, these persistent and destructive creatures are ready to take their toll.

The false wireworms are especially destructive to winter wheat as soon as it is sown in the fall. True wireworms and white grubs begin on the first tiny rootlets and continue to feed on the underground parts of the plant as long as it lives. The Hessian fly lays its eggs on the first leaf, and the little maggots hatching from these eggs crawl down to the base of the leaf, there to absorb the vital sap of the young plant and later, as adults, to produce progeny that attack any older plants that have escaped the ravages of the first generation. The wheat-stem maggots kill many young plants outright and later cut off the straw of others at the joint below the heads, thus preventing the formation of grain. Straw worms do similar injury and, with their near relatives, the joint worms, produce abnormal bulbous growths or galls, the tumors of the wheat plant.

Army worms and billbugs, plant lice and leaf hoppers, cutworms and sawflies, all consider the wheat field their happy hunting ground. The grasshopper, always hungry and eating almost anything—and frequently everything—in sight, sometimes devours all the wheat plants on hundreds of acres.

Just before the grain is formed, the wheat midge, hatching from eggs laid in the blooming heads, absorbs the rich food there, and instead of solid, brown wheat berries, little pink maggots are produced. While the grain is still in the field, unharvested, the dusky yellow Angoumois grain moth—a delicate velvet moth with long, fringed wings—lays her eggs on the heads of the wheat to start a cycle that is carried with the grain into the granary, and there continues generation after generation in the stored wheat.

Many other pests, from grain beetles to flour and meal moths and back to meal worms and flour beetles, launch a concerted attack on the stored grain and later on the flour or prepared cereals stored in sacks or packages. Finally, bread, rolls, and cakes and cookies are all choice morsels to those household marauders, the ants of various sizes and colors.

These are only a few among the several hundred kinds of insects that are known to attack growing wheat and wheat products.

Causes of Increased Infestation

Insect pests of wheat are much worse now than they used to be. In the early days of American agriculture farm lands were not so continuous as now or so intensively cultivated. Native insects such as the chinch bug formerly fed on native grasses, and these grasses had developed, through selection or otherwise, a certain degree of resistance or tolerance to insect attack.

Furthermore, many of our most destructive insects, such as the Hessian fly, have been brought here from foreign countries. In recent

years these insects, as well as a large number that have always been here, have been so especially favored by the existence of an ample and continuous supply of their favorite food—wheat—that they were enabled to "be fruitful and multiply" with a vengeance.

The destruction of native-grass areas that accompanied the gradual increase in the production of small grains has resulted in both foreign and native insects concentrating their attack on wheat, a much more favorable food plant.

Recognition of the reasons for all these losses is the first step toward preventing their continuation. The next is a thorough study of the insects—their life histories, habits, seasonal histories, and various interrelationships.

The per acre value of wheat is so low that control by the use of insecticides has not been practical. However, with information on the requirements of wheat production available to compare with similar information on the factors necessary for insect development, it is frequently possible to solve the problem of insect control by crop rotation, planting at the right time, seed selection, fertilization, practice of the right type and time of cultivation, or other such cultural practices. The Hessian fly, for example, can usually be eradicated by delaying the fall seeding of wheat, a few days in most cases, until the adult flies have emerged, lived their lives of a day or two, and died without finding young wheat on which to lay their eggs.

Wheat insects are very adaptable. While they have many characteristics in common, they differ so widely in their specific habits that a control for one kind seldom suffices for all other kinds. Information on the biology and control of most of these insect pests is available. When injury is observed and information is desired, specimens of the insect doing the damage, together with samples of the injured plant or grain, should be sent either to the grower's State experiment station or to the Bureau of Entomology, United States Department of Agriculture, Washington, D. C.

W. H. Larrimer, *Bureau of Entomology.*

FEED GRAINS and FORAGE

FEED Crops Since 1929 Worth Relatively More Than the Cash Grains Producing feed grains, hay, and forage and converting them into livestock and livestock products, is the major enterprise of American agriculture. Approximately two-thirds of all the land in crops in the United States is devoted to the production of feed crops, of which only a small proportion is marketed as grain or hay. In addition, nearly one-third of the land in farms is pasture land used largely in raising livestock or in producing livestock products.

The proportion of the total land that is used in growing feed grains and hay is affected somewhat by the relation between the prices of feed grains and livestock and the prices of cash crops, such as wheat and cotton. When prices for cash crops are relatively high there is a tendency to shift from the production of feed grains and livestock to the growing of cash crops. On the other hand, relatively low prices for cash crops cause a curtailment of cash-crop acreage and an increase in feed-grain and livestock production. During the last 20 years prices of agricultural products have fluctuated widely and crop shifts have been frequent. In most of the years from 1920 to 1929 the acreage in cash crops was a larger proportion of the total cultivated acreage than in pre-war years. Since 1929 there has been a marked shift in acreage from cash crops to feed grains. The increase in feed-grain production has been accompanied by unusually low feed-grain prices that have been encouraging to rapid expansion in livestock production.

The rapid advance in prices of agricultural products from 1915 to 1920 was accompanied by expansion in nearly all lines of agricultural production. The acreage of the principal crops increased from approximately 303,000,000 acres in 1909 to 348,000,000 acres in 1919. Since 1920 the general price level has been declining, with agricultural prices declining faster than prices of other products. There has been little expansion in crop acreage but more than the usual amount of crop shifting. Before the current depression, prices of cash crops such as cotton, wheat, flax, tobacco, and fresh vegetables were relatively high in comparison with the prices of feed grains, and this encouraged shifting to cash crops. The acreage in the principal cash crops increased from 29 per cent of the total acreage in important crops in 1909 to 35 per cent of that total in 1929. In other words, nearly all the expansion in crop acreage during that 20-year period was in the acreage devoted to cash crops. The acreage in cash crops increased about 43 per cent whereas the acreage in feed grains and hay increased

only 4 per cent. No doubt the displacement of work animals by mechanical power had much to do with the decreased acreage planted to feed grains.

New forces came to bear on the feed-crop situation when the world crisis developed in 1929. As usual in similar circumstances the prices of agricultural products declined more than the prices of other goods. Prices of cash crops declined much more sharply than the prices of livestock and livestock products. This change made feed crops, when marketed through livestock, worth relatively more than cash grains and resulted in a marked increase in the acreage of feed grains. The short corn crops of 1930 and 1931 also encouraged the growing of more feed grains. From 1929 to 1932 the acreage planted to feed grains increased 6.3 per cent or more than during the entire period of 1909 to 1929, whereas the acreage of cash crops declined 13.6 per cent.

Production of Feed Grains and Hay

The areas of production of the different feed grains and hay have changed materially in the last 20 years, but this has caused no noticeable trend in the yields of the different crops. Consequently the total production of all feed grains in recent years has been similar to that of the time before the World War. Production of corn, oats, barley, and grain sorghums in recent years has averaged about 102,000,000 tons or only 5 per cent more than in the 10 years before the war. There was approximately the same percentage increase in production as in acreage devoted to these crops. In 1930 the production of feed grains declined somewhat because of the very short corn crop and amounted to only 87,000,000 tons. Increased acreage and better yields in 1931 and 1932 resulted in a marked increase in production. The production of 113,000,000 tons of feed grains in 1932 was the largest on record, with the exception of that of 1920.

The total acreage devoted to corn showed little change from 1909 to 1929, but there has been a tendency for the corn acreage to move westward and northward. Fifty-seven per cent of the corn acreage was west of the Mississippi River in 1929, as compared with 52 per cent in 1909. All this increase occurred in the West North Central States and in the Mountain and Pacific Coast States, since the total acreage in the West South Central States was smaller in 1929 than in 1909. A decrease in acreage occurred in all other areas, the greatest reduction taking place in the Southern States. There was a tendency during this period to concentrate oat production in the Great Plains area between the Mississippi River and the Rocky Mountain States. In 1909 the oat acreage in this area was 48 per cent of the total crop acreage, but by 1929 it had increased to 58 per cent. All other areas show a marked decrease in oat acreage during this period.

Barley production, in contrast to that of corn and oats, has shown wide fluctuations in the last 20 years. From 1909 to 1918 it increased gradually, but prohibition caused a sharp falling off in the market demand for barley. Production declined sharply in 1919 and remained low until 1924. In recent years the value of barley as a feed has been recognized more widely than formerly. Since 1924 production has increased rapidly until in 1932 the acreage was nearly twice as large as that for 1909. Production has remained concentrated largely in the West North Central States and in California. During the recent expansion in barley acreage there has been a marked increase

in all the area west of the Mississippi River except in California where the acreage has been less in recent years than in 1909.

The production of grain sorghums, which are grown principally in northwest Texas, western Oklahoma and Kansas, and southeastern Colorado, was relatively unimportant before 1909. Since then production has steadily increased from about 18,000,000 bushels in 1909 to 106,000,000 bushels in 1932.

The acreage of hay increased slightly from 1909 to 1919 but then declined until the acreage was about the same in 1929 as in 1909. Unfavorable weather for both new and old seedlings during the drought of 1930 and 1931 further reduced the acreage in hay in 1932. Since 1909 there has been a decrease of hay acreage of 25 per cent in the Northeastern States, 5 per cent in the North Central States, and 10 per cent in the Pacific Coast States, whereas acreage in the Rocky Mountain States has increased 55 per cent and in the Southern States east of the Mississippi River, 28 per cent.

The principal change in hay production has been the shift from grass hays to legume hays. The acreage of alfalfa hay increased from 4,707,000 acres in 1909 to 11,516,000 acres in 1929 and during the same period the acreage of clover hay increased from 2,443,000 acres to 5,612,000 acres. There has also been a marked increase in the use of annual legumes such as soybeans, cowpeas, and vetch as hay. In 1929 the acreage of annual legume hays amounted to over 3,000,000 acres, and as a result of the drought of 1930 and 1931 was greatly increased as an emergency crop to replace the shortage of clover and alfalfa hay in 1931 and 1932.

In addition to the coarse grains and hay, some wheat and rye is fed to livestock in areas where feed grains are scarce. The amount varies considerably from year to year and depends largely upon the level of wheat and rye prices and the relation of these prices to those of feed grains. In recent years prior to 1930, between 29,000,000 and 55,000,000 bushels of wheat was fed on farms and the rye fed averaged about 6,000,000 bushels a year. The short corn crops of 1930 and 1931 and the relatively low prices of wheat and rye resulted in a marked increase in the amount of wheat and rye fed to livestock. In the 1930–31 feeding season, farmers fed 159,142,000 bushels of wheat and 18,762,000 bushels of rye. In the 1931–32 season they fed 184,158,000 bushels of wheat and 14,306,000 bushels of rye.

Production of By-product Feeds

The feeding of by-product feedstuffs (bran, middlings, cottonseed meal, etc.) has developed in the last 50 or 60 years. Little or nothing about the feed value of these products was known before that time. In the eighties farmers in the vicinity of flour mills and breweries began using the by-products as a feed and the demand gradually increased as more information regarding their value as feed became available. By 1910 the by-products of mills and breweries and those from the manufacture of cottonseed and linseed oils had become an important source of feed. The rapidly advancing prices of feed grains during the war greatly increased the use of these by-product feeds.

In recent years the production of by-product feeds has been about 10,000,000 tons or one-tenth the production of feed grains. The virtual stoppage of the manufacture of distilled and fermented liquors in

1920 resulted in a marked decrease in the available supply of high-protein feeds and greatly increased the market for cottonseed and linseed meal and corn-gluten feed and meal. From 1920 to 1927 the production of these feeds increased rapidly. The production of wheat offal fluctuates but little from year to year. The production of by-product feeds depends largely upon the demand for the main products. Consequently the smaller flaxseed and cottonseed crushings, the reduced wet-process corn grindings, and the slow demand for export flour in 1931 and 1932 have limited the outturn of by-product feeds.

The increased use of by-products as feed and the demand for balanced rations in the dairy industry have resulted in a marked increase in the manufacture of ready-mixed feeds. These feeds not only contain by-product feeds but also a large proportion of feed grains; therefore the manufacture of mixed feeds has provided a market for a large part of the feed grains shipped to the central markets.

Utilization of Feed Grains and Hay

Many farmers raise more feed than their own livestock can consume. They sell the surplus either to neighbors who have a shortage of feed or to dealers in local markets who ship it to the central markets or into areas where not enough feed to maintain the livestock is produced. Most of the grain and hay sold locally is fed. The amount of grain shipped out of the county where it is grown may be used as a measure of the amount of grain shipped to central markets or into deficit feed-producing areas. In the years before the World War about 52 per cent of the barley crop, 30 per cent of the oats crop, and 22 per cent of the corn crop were shipped out of the counties where the crops were grown. In the last 20 years there has been a reduction in the proportion of all grain shipped out of the counties where it was grown. During the years 1924 to 1928 the proportion of the barley crop shipped out of the counties where it was grown averaged about 35 per cent, that of oats 24 per cent, and that of corn 18 per cent.

Not only is a smaller amount of grain being shipped out of the counties where it is grown, but a larger proportion of that which is shipped is being fed to livestock on farms in other areas. The amount of barley used by the brewing industry has declined from about 55,000,000 bushels annually before the World War to less than 5,000,000 bushels in recent years. This sharp drop has been partly offset by increased exports and by use of barley in the manufacture of malt. In recent years a much larger proportion of the barley crop has been fed because the livestock-feeding enterprise has been moving northward and westward into areas where the production of corn is limited by a short growing season or the lack of adequate moisture. This westward movement of feeding has been accompanied by the marked expansion of the barley acreage since 1925.

Oats are used extensively only as a feed for livestock. Cereal breakfast foods take barely 3 per cent of the crop. Before the World War a large part of the oats shipped out of the counties where they were grown was used for feeding horses and other livestock in cities. The numbers of livestock in towns and cities have declined rapidly since 1920, so that the amount of oats consumed as feed by animals not on farms is no longer an important part of the total consumption. Consequently a greater proportion of the oats produced is used as a feed on farms. There has been a marked increase in the amount of oats

used in the manufacture of mixed feeds, but most of the oats shipped out of counties where they are grown go to feed livestock on farms elsewhere. Exports of oats have never been a large proportion of the total production, and in ordinary years amount to only 1 or 2 per cent of production.

Over half of the corn shipped out of the counties where it is grown is shipped into deficit corn-producing areas to be used as a feed, the remainder being exported or used in manufacture or in mixed feeds. Before the prohibition act was passed, from 20,000,000 to 25,000,000 bushels of corn were used annually in the manufacture of distilled liquors, but in recent years the amount of corn so used has been negligible. The use of corn in the manufacture of corn starch, corn sugar, and other products of wet-process grinding has increased greatly in the last 15 years, reaching a total of 88,000,000 bushels in 1929. Small amounts of corn are also consumed as a human food in the form of corn meal, corn grits, and hominy. Compared with those of the pre-war period, our exports of corn are small. The average for the years 1924 to 1928 was 21,000,000 bushels against an average of 40,000,000 bushels in the period 1910 to 1914. The grain-sorghum crops are used almost exclusively on farms as feed for livestock. Farmers in recent years have sold only about half as much hay as they sold before the war. The smaller numbers of livestock in towns and cities, and the increased production of hay in deficit-producing areas have greatly curtailed the market movement of hay.

In summarizing, the following points in the supply situation for feed crops are noted: (1) Feed-grain and hay production in the last 20 years has increased much less rapidly than the production of crops grown for cash; (2) production has increased west of the Mississippi River, especially in the West North Central and Rocky Mountain States, and has decreased in other areas; (3) a larger proportion of the feed grains and hay produced is consumed on farms.

Relation of Livestock Numbers to Feed Production

The principal use of feed grains and hay is for the feeding of livestock on farms. Hence, any change in livestock numbers is reflected in the demand for these crops. When allowance is made for the variation in the amounts of feed required by different animals it is found that the *feed requirements of livestock on farms averaged about 10 per cent* higher during the years 1925 to 1930 than during the years 1905 to 1914. The production of feeds increased about 5 per cent in the years 1925 to 1930 compared with the period 1905 to 1914. The smaller increase in feed-grain production has been offset in recent years by the fact that a smaller proportion was used for industrial purposes or was fed to animals not on farms. Thus, the amount of feed per animal available was not greatly different in the later years from what it was before the World War. However, marked changes with an important bearing on feed consumption and on the outlook for feed-grain and hay *production, have taken place both in the proportions of the different* types of livestock and in the ages of each kind of livestock on farms.

Since the census of 1910 and that of 1930 were both taken during April, a comparison of livestock numbers shown by these two censuses should give an indication of some of the changes that have taken place in livestock numbers during the 20-year period. Hog numbers in the two periods were not greatly different. The numbers of hogs, 6 months

old or over, however, were somewhat greater in 1910 than in 1930, indicating that hogs are now being marketed at earlier ages. There has been a marked change in the number and ages of horses and mules. Between 1910 and 1930 the number of all horses and mules declined from 24,149,000 to 18,886,000, a decrease of 22 per cent. It is extremely significant that in horses and mules, 2 years old and over, the decline was only 14 per cent, whereas the decline in the number of colts and yearlings was 74 per cent.

Significant changes in the types and ages of cattle and sheep on farms have also taken place. The number of all cattle on farms was only 3.4 per cent larger in 1930 than in 1910, but there was a marked shift from beef cattle to dairy cattle. The number of dairy cows and heifers increased 17.6 per cent whereas the number of beef cows and heifers decreased 17.5 per cent. In both 1910 and 1930 there were about 30,000,000 cattle other than cows and heifers on farms. In 1910 about two-thirds of these were calves and yearlings and one-third were steers and bulls 2 years old or over. In 1930 about four-fifths were calves and yearlings and only one-fifth were steers and bulls 2 years old or over. Sheep numbers were slightly larger in 1930 than in 1910. The number of rams and wethers on farms in 1930, however, was less than half as great as in 1910, whereas the number of ewes in 1930 was about 38,000,000 as compared with 32,000,000 in 1910.

It is therefore evident that, except for horses, there has been a considerable increase in the proportion of breeding stock on the farms and a marked decrease in the proportion of older animals being fed for market. This increase in breeding stock and the marketing of livestock at earlier ages have made it possible to market a larger number of livestock annually without increasing the number of livestock on farms. Young animals generally utilize feed more efficiently than older animals. Hence, the change increases the output of meat and dairy products per unit of feed consumed. However, the relatively larger proportion of mature horses and mules on farms and the increase of dairy cows in contrast to the decrease of beef cows, tend to increase the feed requirements per head of horses and cattle. Adult horses and mules use more feed than colts; dairy cows commonly get more grain than beef cattle.

The Effect of Price Relationships on Feeding

The amount of feed grains fed per animal varies materially from year to year, not only because of fluctuations in the production of feed grains, but also in response to the relationship between the prices of feed grains and the prices of livestock and livestock products. Feed is the raw material of meat and milk. When it is relatively high in price, producers market their livestock at lighter weights, and feed dairy cows a smaller amount of grain and more roughage. On the other hand, when feed prices are relatively low, producers market their animals at greater weights and milk cows are fed more grain.

Comparison of feed-grain prices and the prices of meat animals and of dairy products over a period of years is significant. A measure of changes in feed-grain prices over a period of years can be arrived at by combining the average yearly prices of corn, oats, and barley according to their importance as feeds, and then using the average of these combined prices for the years 1910 to 1914 as equal to 100 per cent. When thus combined and converted to a percentage, the percentage of 70 for

1906 means that the prices of feed grains in 1906 were 70 per cent as high as they were in the years 1910 to 1914. Similarly the prices of cattle, hogs, and sheep can be combined to represent livestock prices, and the prices of butter and of fluid milk can be combined to represent dairy-product prices. When all of these combinations are made and converted into percentages with the average prices of the years 1910–1914 equal to 100, it is possible to say whether feed prices were relatively high or low at any time in comparison with the prices of meat animals or with dairy products.

For example, in 1906, livestock prices were 67 per cent, dairy product prices 77 per cent, and feed prices 70 per cent, of those of 1910–1914. Comparing these percentages it is evident that in 1906 dairy-product prices were relatively higher than feed-grain prices, whereas livestock prices were relatively lower than feed-grain prices. The relationship of feed-grain prices to prices of meat animals and of dairy products can be shown still more easily by dividing the 77 per cent for dairy products and the 67 per cent for meat animals by the 70 per cent for feed grains. Thus, we find that in 1906 the prices of dairy products were 110 per cent as high as feed-grain prices and the prices of meat animals

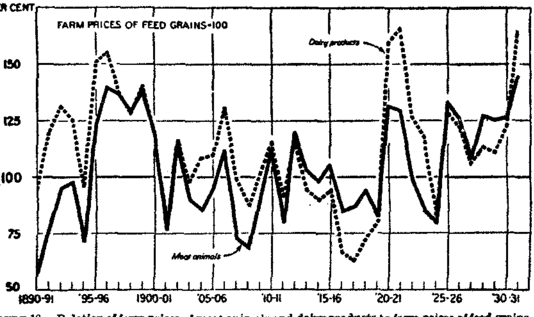


FIGURE 18.—Relation of farm prices of meat animals and dairy products to farm prices of feed-grains, 1892–1931. In years when the lines in the above chart have been above 100, feed-grain prices have been relatively low in comparison with prices of livestock or prices of dairy products. The periods of unusually low feed-grain prices, 1895–1900, 1920–21, and 1931 were the most favorable periods for the feeding of livestock. During the years 1916–1919, when feed prices were relatively high, conditions for feeding were least favorable

96 per cent as high as feed-grain prices. Such a comparison has been made for each year from 1890 to 1931, and the results are shown in Figure 18. The chart was extended back over the period of unusually low prices in 1895 and 1896 so that that period could be compared with the present period of unusually low prices.

During the last 42 years there have been three periods in which the prices of livestock and dairy products were unusually high in comparison with the price of feed grains. These were 1895 to 1900, 1920 to 1921, and 1931, with relatively the highest meat-animal and dairy-product prices occurring in 1931. Farmers respond promptly to these relatively high prices; they respond first by increasing the amount of feed fed per head of livestock. Eventually, if the relatively high prices for livestock and dairy products continue, they increase the numbers of livestock.

In periods when livestock and dairy-product prices are relatively low, as in 1916 to 1919, producers tend to feed less grain and in the long run to curtail the production of livestock.

Resemblances to Earlier Periods

The feeding situation in 1931 and 1932 has several features similar to those of 1895 and 1896, in addition to the relatively high prices for livestock and dairy products. The year 1894 was one of severe drought similar to 1930. In 1895 feed supplies were more plentiful than in the previous year and in 1896 were much above average—situations similar to those in 1931 and 1932, respectively. Still other resemblances may be noted. Prices of agricultural products in 1895 and 1896 were at unusually low levels, the same as at present. The hog-production cycle, as indicated by inspected hog slaughter, reached its low phase in 1893 and 1894, whereas the low phase in the present cycle was reached in 1930 and 1931. The low phase in the cycle of cattle numbers on farms came in 1895 and 1896, whereas the low phase in the present cycle was reached in 1928 and 1929. Both in 1895–96 and in 1931–32 livestock numbers were relatively low and the relationship of feed prices to livestock and livestock-product prices encouraged feeding.

In view of these similarities it is interesting to note what happened after 1895–96. Both feed-grain production and livestock production expanded at an unusually rapid rate. By 1900–1901 inspected slaughter of hogs had reached 30,000,000 as compared with about 17,000,000 in 1892–93. Cattle numbers on farms increased very rapidly and reached a peak in 1904. Sheep and lamb slaughter more than doubled from 1890 to 1902. The growing of lambs for market in the nineties, however, was just getting under way. Hence, the percentage increase appears large in comparison with the absolute increase.

It need scarcely be said that the course of the livestock industry after 1895–96 does not necessarily indicate what may be expected now. Present conditions, although similar to those of the nineties in some respects, are very different in others. In the nineties the farm area was expanding rapidly, so that the increase in livestock production was not only an expansion from a low point but also a continuation of a marked upward trend. At the present time there is not the possibility of expansion in farm area that there was in the nineties, therefore so prolonged an expansion in livestock production is unlikely. On the other hand, however, a much larger proportion of present livestock is breeding animals. This fact and the marketing of livestock at early ages permit a more rapid expansion or contraction of livestock production than was possible in the nineties. In the future, periods of increasing and decreasing numbers may be shorter but the fluctuations may be about as great.

Recent Adjustments in Feed-Grain and Livestock Production

Price changes as drastic as those that have taken place since 1929 tend to upset farmers' production and marketing plans. As already noted, the area devoted to cash crops has decreased and the area devoted to feed crops has increased in the last three years. In 1932 the production of feed grains was unusually large. Farmers will have to increase livestock numbers in order to find an outlet for the feed supply. The increase in hog numbers, which began in 1931, was tempo-

rarily checked in 1932 because of the short corn crop in the western Corn Belt in 1931. Indications are that the increase in hog production is now being resumed. Low prices for cows have resulted in the holding back of dairy and beef cows, and breeding stock on farms is now at the highest level in the history of this country. Sheep numbers, which reached a new high record in 1931, were reduced somewhat by the unfavorable winter of 1931–32 but it is still uncertain how far this decrease will continue. Low feed prices have encouraged the use of horses and mules, but the supply of breeding stock is so low that horse numbers are sure to continue to decline for several years. The extent to which this increase in feed-grain and livestock production will continue is uncertain and depends largely upon the relationship that will come about in the next few years between livestock and livestock-product prices and the prices of cash crops.

C. M. PURVES, F. J. HOSKING, *and* C. L. HARLAN,
Bureau of Agricultural Economics.

FEEDING Experiments With Cereal Grains Indicate Ways of Profitable Use

The outstanding developments in the feeding of cereal grains in recent years have had to do with feeding wheat and oats to cattle and hogs in order to make use of surpluses. Since 1910 the consumption of wheat per person in the United States has been decreasing. This decrease, together with a loss of export trade, has resulted in a wheat surplus which could advantageously be fed to livestock. A surplus of oats has resulted largely from the displacement of horses by automobiles, trucks, and tractors.

Feeding experiments with wheat have been chiefly in methods of preparing the grain and in comparing its value with that of corn. Several Corn Belt experiment stations have proved that wheat is practically equal to shelled corn for fattening cattle. In some studies, especially hog feeding, wheat has given slightly better results than corn. However, for hogs as well as cattle, coarse grinding or rolling is necessary. Wheat fed to horses should not constitute over half of the grain ration. At the United States Animal Husbandry Experiment Farm, Beltsville, Md., two lots of steers have been successfully self-fed on coarsely ground and rolled wheat.

At the United States Range Livestock Experiment Station, Miles City, Mont., two lots of weanling colts were fed with good results on a ration of good alfalfa hay and whole wheat, the wheat serving as a substitute for oats. At the same station good results were obtained from feeding range ewes one-half pound of hard winter wheat per head daily before lambing and 1 pound per head daily after lambing.

At the Belle Fourche Field Station, Newell, S. Dak., wheat, barley, and oats showed practically the same value when fed with pressed beet pulp and alfalfa to fattening lambs. In the same experiments, each of the three grains was about 90 per cent as valuable as corn for fattening lambs.

Oats may constitute one-third of the concentrate in the rations of beef calves that are being creep-fed and fattened, when oats are as cheap per pound, as corn, or cheaper. While coarse grinding of grain generally is far superior to fine grinding for livestock feeding, oats ap-

parently should be very finely ground for hogs. It has been found that practically one-half more crushed oats than very finely ground oats are required in hog feeding to obtain the same result. Oats seldom require grinding for other livestock.

When Grinding Is Desirable

The Wisconsin Agricultural Experiment Station has shown conclusively that medium to coarse grinding is better than fine grinding so far as actual nutrition of the livestock is concerned. Coarse grinding is economical, because doubling the size of perforations in the screen of a hammer mill may cut the cost of power 40 to 50 per cent.

Additional experimental work conducted recently by the Minnesota station shows that roughage should not be ground for fattening cattle and that corn need not be ground if enough hogs are kept with the cattle to clean up corn in the droppings. Barley, however, should be ground to medium fineness, according to the Minnesota experiments, even though hogs are following the cattle. In general, grinding corn and oats for farm livestock is not profitable. In no case, except that of very flinty grain, should grains or roughages be ground or chopped for sheep that have good teeth.

The Kansas, Oklahoma, and Texas stations have conducted numerous experiments which prove that the grain sorghums such as milo, kafir, feterita, and hegari are practically equal to corn and other cereals for fattening livestock. Texas experiments in cooperation with the Bureau of Animal Industry of the United States Department of Agriculture have shown that grain-sorghum heads should be ground but not threshed for fattening cattle. However, the heads may be fed to hogs without being ground, because the hogs are forced to eat them slowly and consequently chew the grain sufficiently for efficient digestion. The grain sorghums, especially kafir, are being used extensively for poultry. Good results have been reported in replacing a large percentage of the corn in the ration with yellow milo, red milo, or hegari, provided green feed or cod-liver oil is included in the diet.

Since corn is so extensively used in livestock feeding, one of the foremost feeding problems is that of protein supplements. Livestock producers have been shown for years the advantages of feeding protein supplements such as cottonseed, linseed, and soybean meals. Such supplements have proved especially valuable in conserving corn where plenty of good legume hay is not available. But when corn is so plentiful that there is not crib room for it, and so cheap that it threatens to compete with coal as fuel, there seems to be little incentive to economize in its use. In most of the cattle-fattening experiments during the last 25 years a rather narrow ratio of protein meal to grain, ranging from 1 to 4 to 1 to 7, has been used. However, the few experiments in which wider ratios such as 1 to 10 were used, have given good results.

Addition of Concentrates

According to the results of a cooperative study by the Department of Agriculture and certain State stations on costs and methods of fattening beef cattle in the Corn Belt from 1919 to 1923, the addition of 1 to 1¼ pounds of protein concentrates per head per day in fattening 800–900-pound cattle has no financial advantage when corn is 14 cents a

bushel, mixed hay $5 a ton, straw $2 a ton, silage $2 a ton, and protein concentrates $20 a ton, unless the supplement-fed cattle sell for more per pound than cattle fed no protein supplement. At the time of the experiments, such cattle fed a protein supplement sold for 7 per cent more per pound than did similar cattle that received no supplement. Probably the same is true now. On a 1,000-pound steer selling at 6 cents the gain would amount to $4.20. Therefore, even at present prices for corn and protein concentrates, feeding a little cottonseed meal, linseed meal, soybean meal, or soybeans to 2-year-old and younger cattle is likely to be profitable. In a ration containing plenty of good legume hay there is the least reason for feeding the concentrates, and the quantity fed may be as small as one-half pound per head per day. On the other hand, if the roughage consists principally of silage, straw, stover, or grass hay, as much as 1½ pounds of such supplements per head per day can be fed to advantage.

A common problem in fattening cattle is whether to substitute molasses for corn. Experiments have repeatedly shown that, pound for pound, corn is more valuable in a fattening ration than molasses. However, a small quantity of molasses, such as ½ to 1 pound per head daily, used as an appetizer, slightly increases feed consumption and rate of gain in weight, according to the Ohio station. If this can be accomplished without increasing the cost of a unit of gain, it is likely to be profitable. Molasses in the ration of creep-fed calves has been tried at Sni-a-Bar farms, Kansas City, Mo., without showing any advantage over a ration of mixed concentrates without molasses.

In fattening lambs on corn, wheat, or oats, and alfalfa hay at present prices, there is no financial benefit in adding protein-rich concentrates to the ration.

Corn continues to be one of the best, cheapest, and most-used grains for poultry feeding and makes up about half of most poultry rations. Recent experiments have shown that yellow corn, because of its vitamin A content, is especially desirable for feeding poultry that is confined to yards. It is not so important where the poultry has an outdoor range with plenty of green feed.

Rice bran, a by-product of milling rice for human consumption, has been found effective in preventing perosis or deforming leg weakness in poultry. Oat mill feed and barley also have some value in preventing perosis. Brewers' rice and rice polish have practically the same feeding value in a fattening ration as corn, except that the quantity of rice polish fed to hogs must be limited on account of its tendency to produce soft pork.

An experiment at the United States Animal Husbandry Experiment Farm, Beltsville, Md., in feeding scabby barley to poultry has shown that ground scabby barley gives as good results as sound barley, when fed in a laying mash. At the same station scabby barley was found to be quite as palatable and efficient as sound barley in fattening steers. Similar results were obtained at the Illinois station.

While rye has practically the same composition as other cereals, it is rather unpalatable to livestock and generally should not constitute more than one-third of the concentrates in the ration. The Wisconsin station reports that ground rye is not desirable as a feed for young chickens. It is generally considered an undesirable poultry feed.

A. T. Semple, *Bureau of Animal Industry.*

CORN Hybrids Result From Crossing Carefully Selected Parent Lines Interest in corn hybrids has, for a number of years, been growing. Hybrid seed corn has resulted from the efforts of corn breeders to reduce the cost of corn production by making possible materially larger acre yields of higher-quality corn. Naturally there has been more publicity about this effort in the Corn Belt and surrounding States, where hybrids already are in commercial production, than elsewhere. The number of requests for information coming to the United States Department of Agriculture, however, indicate a widespread interest in hybrid corn, its possibilities and limitations.

Corn hybrids have several things in common with the mule. The mule is the first-generation hybrid between the mare and the ass. Having no pride of ancestry or hope of posterity, it must live for the present only. This it does with vigor, to the great benefit of its owner. Corn hybrids are the first-generation hybrids between two or more inbred strains of corn. The inbred parent strains are so inferior they can not be a source of pride. Although the hybrids produce posterity, the second and later generations can not be used for seed without a loss in yield. Corn hybrids, then, must be produced anew in each generation. During that generation a good hybrid produces a materially larger acre yield of good-quality corn than do the best ordinary varieties, to the considerable benefit of its grower. Finally, neither all mules nor all corn hybrids are good.

Reproduction in Corn

In order to understand just what hybrid corn is, it is necessary to know how the corn plant reproduces. Each kernel of corn results from the fertilization of an egg by a sperm. The egg is at the base of the silk and the sperm is carried by the pollen. It therefore is customary to speak of the plant on which the ear is produced as the female parent and of the plant or plants supplying the pollen as the male or pollen parents.

Ordinarily, corn is wind pollinated, the pollen being carried at random through the air and some of it falling on receptive silks. Selecting an ear from a good plant, accordingly, is selecting the female parent only. Each kernel on the ear may have been pollinated from a different male parent plant. It is this condition that has made it impossible to select varieties of corn that breed true for any but the most simple characters. The breeder sees only what the female parent is like; the pollen parent is unknown. Moreover, many characters are not expressed in the hybrid condition. Thus, a true-breeding red corn crossed with a white corn produces nothing but red ears in the first generation. Nevertheless, if such a cross is grown in the next generation, about one-fourth of the ears will be white and three-fourths red. The breeder sees then only what the female parent looks like, not what the selected ear will produce.

In spite of these difficulties, the better varieties of corn have been developed to a relatively high state of productiveness by careful selection over a long period. This has been done by reducing the proportion of unfavorable characters to such a low level that any one is expressed but seldom. Always, however, even in the best varieties, most of the plants are below par because of one or more unfavorable characters, and some of the plants are barren or produce nubbins because of serious inherited faults.

Controlled Pollination

The development of a good hybrid comprises (1) selecting the best possible inbred lines and (2) finding the best hybrid combination of one kind or another for commercial utilization. The final hybrid thus is the product of many years' careful selection and experiment. During this breeding period all pollinations are made by hand. Ear shoots and tassels are protected from stray pollen by covering them with paper bags. (Fig. 19.) At the proper time pollen is applied to silks to make the desired mating, and the pollinated ear shoot is again protected. In this way the parentage on both sides is definitely controlled.

FIGURE 19.—Method of covering corn ear shoots with paper bags to control pollination

Selection of Inbred Lines

The first step in hybrid-corn breeding is the isolation of inbred lines or strains. Plants of one or more varieties of corn are self-pollinated, pollen being placed on the silks of the same plant from which it came. The best of the resulting ears are planted, an ear to a row, and plants within these rows again are self-pollinated, and so on for several generations. Each year, however, only the best plants from the best rows are selected for continuing the various strains.

Among the most noticeable immediate effects of self-pollination are the decrease in the size of the plants and ears and the many peculiar characters that come into expression. With continued inbreeding there is a marked increase in the uniformity of the plants within any progeny row, although the differences from row to row are extreme. Some strains are discarded almost at once because of grossly unfavorable characters. Others are better and are continued. So far, however, among the thousands of inbred strains that have been isolated, none has been found even approaching ordinary corn in size or production. After some five to seven generations of self-pollination the strains breed practically true for whatever characters they possess. Every plant of any strain is practically like every other plant. After this it is unnecessary to self-pollinate in propagating a strain. Pollination between plants of a strain is then essentially like self-pollination.

It is these inbred strains, themselves very inferior, that are the basis of hybrid seed corn. They are of value in several ways. In the first

place, they are uniform from year to year. This gives the corn breeder his first fixed material with which to work. Again, the different inbred strains have some outstandingly good characters. Thus, some regularly produce long ears, others have stiff stalks or good roots or are resistant to disease, and the like, and it is these good characters that the corn breeder must bring together into desirable combinations. Finally, no two have exactly the same set of undesirable characters. As already mentioned, many characters are not expressed in the hybrid condition. This is particularly true of characters unfavorable to growth and production. Consequently, when two inbred strains having different sets of undesirable characters are crossed or hybridized, many of these characters are suppressed in the first hybrid generation.

Finding Good Hybrid Combinations

To a certain extent the breeder can select inbred strains for crossing on his knowledge of their characters. Beyond this, however, he must rely for the present on testing large numbers of hybrids to find those strains that combine best. The inbred strains producing the poorer hybrids are discarded. Those producing the best hybrids are again crossed and the hybrids tested more adequately. Eventually, through continued elimination and selection, a few lines that combine to advantage in several combinations are found. (Fig. 20.) Finally, some two or three combinations that have been among the best in a given locality during several seasons are placed in commercial production.

Different Kinds of Hybrids

Inbred strains may be combined into different kinds of hybrids. The simplest of these is the single cross, or hybrid between two strains. Thus, designating the female parent first in the customary way, A×B designates the single cross of strain A pollinated by strain B. The seed of the cross is that produced on the plants of strain A and may not appear noticeably different from self-pollinated seed of A. The vigor of hybridity becomes evident, however, shortly after germination begins.

The 3-way cross is the hybrid of a single cross between two inbred strains as one parent, and a third inbred strain as the other parent. It is customary to use the single cross as the female and the third inbred strain as the male parent in producing a 3-way cross. Thus (A×B)×C designates the single cross A×B pollinated by strain C. The crossed seed produced on the vigorous A×B plants is superior in quality and quantity to that produced on inbred plants as in single crosses. (Fig. 21.)

Double crosses are hybrids between two single crosses, involving four different inbred strains. Thus, the double cross or hybrid (A×B)×(C×D) designates the hybrid of the single cross A×B pollinated by the single cross C×D. Here, both the male and female parent plants are vigorous hybrids. The seed quality and production are high, as in 3-way hybrids, and there is every possible assurance of abundant pollen from the male parent, which is not true when this parent is an inbred strain.

The cross of a commercial variety by an inbred strain has been variously designated as a top cross, inbred-sire cross, and the like. In limited experiments, some such crosses have yielded more than ordinary varieties but less than comparable double crosses. Their chief

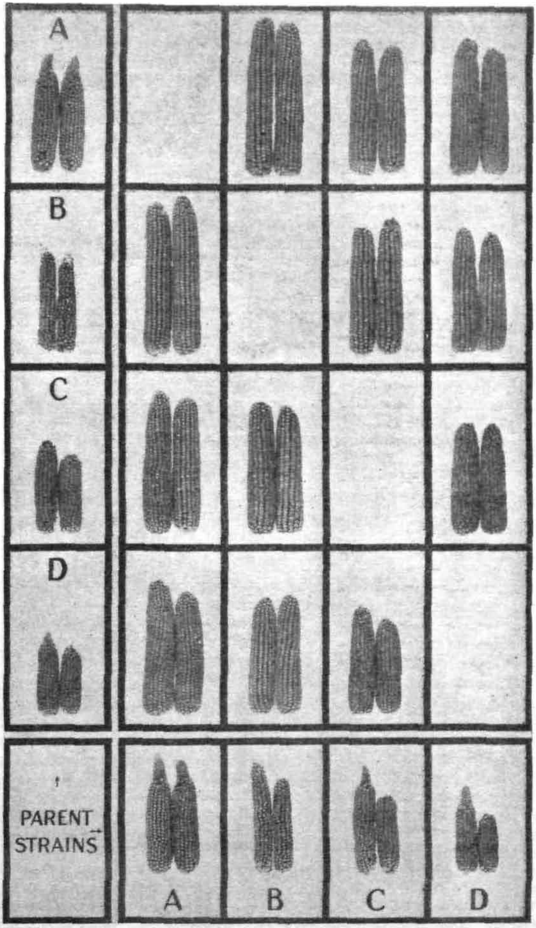


FIGURE 20.—Representative ears of four inbred lines of corn and of the six single-cross hybrids among them. *The ears of the inbred parents, A, B, C, and D, are along the left and across the* bottom margins. The hybrids are in the appropriate squares at the intersection of the leads to the parents, each hybrid being shown twice. The two ears (inbred D and Hybrid CD) banded together are from the same plant

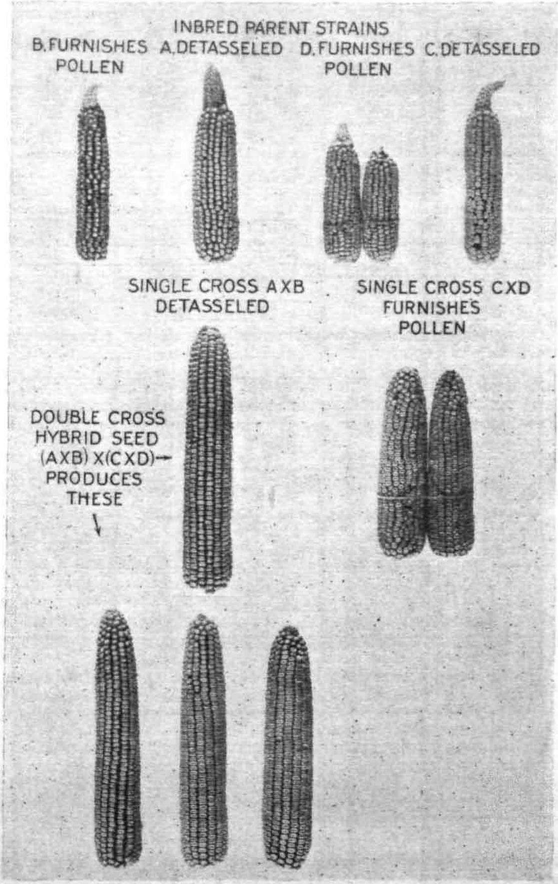


FIGURE 21.—Illustration of the production of double-cross hybrid seed corn. The ears of the parent inbreds at the top breed true if self-pollinated. A pollinated by B, and C pollinated by D, however, produce the single crosses shown. Single cross (A×B) pollinated by single cross (C×D), as illustrated, is the double-cross seed used for producing the commercial crop. Ears banded together are from the same plant

value at present appears to be in the fact that it is easier to find one inbred that will combine well with some standard variety than to find three or four inbreds that will produce a good 3-way or double cross.

Advantages of Different Hybrids

Any of these hybrids can be used for planting for commercial corn production. The single cross is at a disadvantage because of the low yield of seed and its consequent high cost. Moreover, the irregular size and shape and the generally small kernels of present field-corn inbreds make the commercial utilization of single crosses impractical. Single crosses produce the most uniform plants and ears of any of the hybrids. They accordingly have special value where uniformity is most important. Thus, uniformity is highly desirable in sweet corn for canning, and, to some extent, single crosses between inbred strains are being used commercially for this purpose. In field corn, however, 3-way and double-cross hybrids will be used unless much better inbred strains are developed.

The 3-way cross has no particular advantage over the double cross. It is slightly more uniform but not importantly so, and probably the main reason for the production of 3-way crosses commercially has been that it was easier to find three reasonably good inbred strains than four. The serious disadvantage of the 3-way cross is that an inbred strain must be relied upon to supply pollen for the cross. Unless an inbred that can be counted on for this purpose is available, the 3-way cross is impractical. Even a reasonably good pollinating strain requires a somewhat larger proportion of male parent plants with a somewhat higher cost of seed production. For the present and for some time to come, therefore, the double cross seems to be the most practical source for hybrid seed corn.

The user of hybrids need not worry about whether he is getting single-cross, 3-way-cross, or double-cross hybrid seed, if it is of good quality (quality including size and shape suitable for machine planting) and if it has a definite record of productiveness. The producer of hybrid seed will be governed largely by his individual facilities and the inbred strains that are available to him.

Producing Hybrid Seed Corn

Regardless of what kind of hybrid seed is involved, only the first generation of the hybrid should be sold or used for commercial planting. Only from this generation, i. e., the seed that was actually cross-pollinated by an unrelated strain or hybrid, is the maximum benefit of hybrid vigor to be obtained. The second generation of any hybrid, that is, the seed produced by the first generation, may be expected to yield from about 10 to 25 per cent less than the first generation, the exact decrease depending upon the particular hybrid. It is this fact that necessitates producing the hybrid anew for each season's use.

Hybrid seed is produced for commercial use by growing rows of the two parents in an isolated field and detasseling the plants of the female parent. In general, a field for this purpose should be not less than 40 rods from other corn unless there are buildings, trees, or other barriers between, or unless the two fields do not tassel at the same time. From two to four rows of the female parent can be planted to every row of male parent. If an inbred strain is to furnish pollen, it is safer to plant

not more than two rows of the female parent. If a vigorous hybrid is to be the male parent, four rows of the female parent can alternate safely with one row of male in the Corn Belt. As the seed comes only from the female-parent rows, this is a good reason for using a vigorous male parent.

Detasseling at Blossoming Time

During blossoming time the field is gone over at regular intervals and all tassels are pulled from the female parent plants before they shed pollen. With few exceptions the tassels emerge enough so that they can be seen before they begin to shed. A quick upward pull at this time takes the tassel out cleanly without damage to the plant. Tassels pulled too early are likely to bring with them part of the top of the plant, with some damage. On the other hand, it is not safe to wait too long, lest the tassels begin to shed before they are pulled. Therefore it is necessary to go over the field practically every day until detasseling is completed.

For large-scale hybrid-seed production the inbred strains and primary single crosses also are produced in isolated fields. This need not be considered here. For small-scale production, as for home use, it is probable that stocks of the inbred parents and single crosses can be maintained more easily by hand pollinating. A 1-acre unit for producing seed of the double cross (A×B)×(C×D) may be taken as an example. With three rows of the female parent A×B to every row of the male parent C×D, one man easily could take care of the necessary detasseling. On the very safe basis of an estimated acre yield of 40 bushels, the three-fourths of the plants detasseled will produce 30 bushels of double-crossed seed. With a loss of one-third in culling, this will provide a minimum of 20 bushels, or enough to plant between 120 and 140 acres.

To provide single-crossed seed for the 1-acre field each year and to maintain the parent strains would require only some 200 or fewer pollinations. Thus, 20 plants of each of the parent strains would be ample to maintain these stocks. An additional 90 plants of strain A to be cross-pollinated by strain B, and 30 additional plants of strain C to be pollinated by strain D, would supply enough single-crossed seed for the acre, with a liberal margin of safety.

Yields of Hybrids

It is clear that the labor and expense of hybrid-seed production can be justified only if the hybrids will yield materially more than the best open-pollinated varieties. Yields from the Iowa corn yield test show the extent to which the yield is increased. The Iowa corn yield test has been conducted for several years by the Iowa Corn and Small Grain Growers' Association in cooperation with the Iowa Agricultural Experiment Station and the United States Department of Agriculture. Upon payment of the required fee, anyone can enter his corn and have it tested in one or more of the 12 districts into which the State is divided. Entries are divided into two classes, open-pollinated and hybrid. These are tested in such a way that the yields are entirely comparable.

Among the 701 entries scattered through 11 districts in 1931, there were 460 hybrid and 241 open pollinated, the latter presumably representing the best varieties grown in the different parts of the State.

The 12 districts are shown in Figure 22. The average acre yield of the higher-yielding third of the open-pollinated entries in each district is given in figures at the bottom and to the left of the three vertical bars.[6] The superiority in acre yield in bushels of the best open-pollinated entry in the district is indicated by the height of the left-hand bar and is stated in figures above that bar. In the extreme northwestern district the average acre yield of the upper third of the open-pollinated entries was 36 bushels. The best variety yielded 2 bushels more than this, the upper third of the hybrids yielded 5 bushels more, and the best hybrid yielded 8 bushels more than 36 bushels.

It seems safe to assume that the yield of the best open-pollinated entry in each district represents the most that could be obtained from open-pollinated varieties in that season and locality. The much larger yields of the better hybrids are self-evident. As an average for the 11 districts in 1931, the upper third of the open-pollinated varieties yielded 56 bushels, the best open-pollinated varieties yielded 59 bushels, the upper third of the hybrids 62 bushels, and the best hybrids 68 bushels. On this basis, the upper third of the hybrids yielded 10.7 per cent and the best hybrids 21.4 per cent more than the upper third of the open-pollinated varieties. These results are not unique. Similar differences have been obtained in Iowa as well as in many other States, in previous years. It seems to be conclusively shown that materially larger acre yields can be had from corn hybrids.

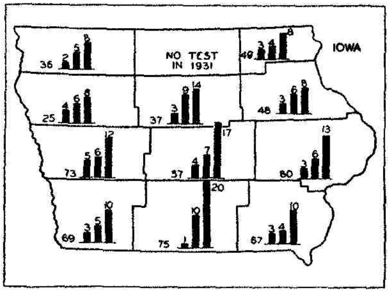


FIGURE 22.—Acre yields, in bushels, of the higher-yielding third of the open-pollinated varieties in 11 districts of the Iowa corn yield test in 1931 (values at the bottom and to the left of the three vertical bars) and the excess acre yield of the best open-pollinated variety (left-hand bar), of the higher-yielding third of the hybrid entries (middle bar), and of the best hybrid entry (right-hand bar)

Not All Hybrids Are Productive

It should be emphasized here that not all hybrids are productive. The foregoing comparisons are based on the better hybrids. If one can know he is getting a better hybrid, that is all that is of interest. This fact must be known from the previous performance or from the reliability of the source from which hybrid seed is obtained. The lowest yield in each of the six districts in the southern half of Iowa in 1931 was made by a hybrid entry. A grower buying hybrid seed just because it is hybrid has no assurance that he will not have to pay a tremendous price for it in low yield.

It should also be emphasized that adaptation is just as important in hybrid seed corn as in ordinary varieties. Hybrids adapted to southern Iowa are too late-maturing to be grown safely in northern Iowa.

[6] Data from the following publication: ROBINSON, J. L., and BRYAN, A. A. IOWA CORN YIELD TEST RESULTS FOR 1931. Iowa Corn and Small Grain Growers' Assoc., Ames, Iowa, Rpt. 12, 32 p. 1932.

The fact that a hybrid is productive in Ohio is little evidence of its value in Missouri or Kansas.

Finally, hybrid seed corn will not produce large yields in spite of poor soil and poor culture. The plants are more efficient in general. But where fertility or moisture is available for an acre yield of no more than 20 bushels of corn, this condition is the limiting factor whether the seed be a variety or a hybrid. The purchase of hybrid seed to plant on unproductive soil rarely will be profitable.

Sources of Hybrid Seed

This article is written to give information on what hybrid seed corn is, not as propaganda for its immediate and general use. Such propaganda would be premature in many localities, inasmuch as hybrid seed or the parent inbreds are available in only a relatively few States at the present time. The United States Department of Agriculture and many of the State experiment stations, however, have corn-breeding programs aimed at the production of hybrid seed corn, and within a very few years such seed should be more widely available. Already several commercial seed companies are offering hybrid seed for sale and a few of the State experiment stations are distributing hybrid seed for trial and single crosses for production of double-crossed seed on the farms. Anyone interested in hybrid seed corn should write to his State agricultural experiment station for information on the availability of hybrid seed adapted to his locality.

The development of inbred strains for the production of hybrid seed is a more elaborate project than most farmers are justified in undertaking. Occasional individuals with the necessary time and facilities may be interested in this phase of corn breeding. It is suggested that such individuals obtain United States Department of Agriculture Bulletin 1489, Corn Breeding, which contains a more detailed discussion of the principles and practice of this and other methods.[6]

FREDERICK D. RICHEY, *Bureau of Plant Industry.*

BARLEY Acreage Is Increasing Because of Crop Feed Value

Farmers to-day think much more highly of barley as a feed than they did 15 years ago. This change has been gradual. Despite a lessened commercial demand, acreage and production of barley have increased. The quantity of barley fed on the farms where it is grown is much greater now than in 1918. Dairy farmers are using more and more barley. There has even been a recent increase in the acreage in the Eastern States, where heretofore barley has been considered of more or less dubious value.

The increased use of barley as a feed has been accompanied by the production and distribution of higher-producing varieties by Federal and State experiment stations. Trebi barley produces high yields under a wide range of conditions. It has spread from a single locality in Idaho, where it was first commercially grown in 1917, until it is widely distributed in the United States and Canada.

Smooth-awned varieties have been produced by State and Federal plant breeders as a direct offering to the feeders. Nearly a dozen are

[6] Department Bulletin 1489, Corn Breeding, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 25 cents.

now in the hands of the farmers. The greatest acreages of smooth-awned barleys are in the upper Mississippi Valley and in California. Among the smooth-awned varieties from which a farmer may choose one adapted to his locality are Vaughn, Glabron, Velvet, Comfort, Flynn, Hero, Wisconsin 38, and Spartan.

In the Southeastern States the barley acreage has been extended by the use of hooded varieties. Such varieties do not yield as much as awned sorts, but the farmers in this area prefer them. In all localities where barley is a minor crop, objections to the awns are common, but Coast barley, which has the harshest awn of any commercial variety, is frequently cut for hay with satisfactory results.

There is a real, outstanding, and growing interest in barley as a feed. It is filling a place in the livestock programs of many farms.

Sometimes an Important Cash Crop

Barley is sometimes, also, an important cash crop. Maltsters are usually willing to pay a premium for suitable malting barley. The farmer, however, should not lose sight of the fact that only a part of the crop can be used in malting. At present this part is a rather small percentage of the whole, only about 8 per cent of the 1932 crop; and even with future maximum expansion of malting it will probably not be over 25 per cent of 1932 production. Farmers in suitable sections who plan to sell their barley should grow and handle it in such manner as to supply the product wanted. They should choose a suitable variety and give it proper care in growing, threshing, and storing. An unfavorable situation results when too large supplies of malting barley reach the market because of favorable seasons in sections not usually a factor on the market. The price of malting barley then approaches that of the feed grades, and the man who has taken extra pains in growing his crop loses his labor. The following season he is likely to be much less careful. If maltsters wish to maintain a high-grade source for their requirements they must recognize this fact and pay accordingly. However, there can never be a complete separation of feed and malting barleys, although the present trend is toward separating them to some extent.

The export barley of the Pacific coast is consumed mostly in England. The type desired there is not the same as that demanded in the United States trade. Careful harvesting and cleaning are raising the average quality of this barley, and with the use of suitable varieties this cash market should be maintained easily.

H. V. Harlan, *Bureau of Plant Industry.*

OAT Varieties Have Regional Adaptation; Remain Major Crop On the basis of varietal differences and environmental conditions, and for convenience of discussion, the United States may be divided into seven oat regions: Northeastern, north central, central, southern, Great Plains, Rocky Mountain and Intermountain, and Pacific. (Fig. 23.) The north central region, which primarily embraces the Corn Belt and some additional territory on the north, constitutes the most intensive and productive single oat region in the world. It includes about three-fourths of the total national oat acreage, on which is produced about

four-fifths of the total oat crop of the country. Although oats are extensively grown in the other regions, the crop is less important there than in the Corn Belt. Less than one-tenth of the annual oat crop is produced in the three western regions. In the southern and Pacific regions the crop is grown from both fall and spring seeding. In all other regions it is grown from spring seeding. Oats are grown on both irrigated and dry land in the western United States.

Oats are not important as a money crop, but they are a valuable feed for horses, dairy cows, young stock, and poultry, and they are particularly suited to be grown in rotation with corn. For these reasons oats continue to be a major crop.

Naturally there is much variation in the range of adaptation of oat varieties in so large a territory as the United States. Not only does

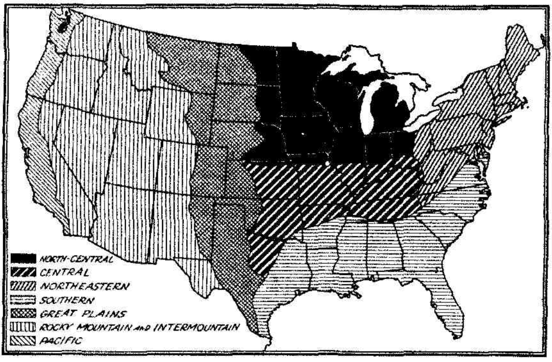


FIGURE 23.—Outline map of the United States showing the general oat regions

the adaptation of varieties differ among regions, but there also is a considerable range within individual regions.

There are many commercial strains of oats. For the most part these belong to a relatively small number of distinct botanical varieties. Two strains may be identical in plant characters, yet differ greatly in inherent yielding ability or in resistance to disease. The one best measure of the value of a variety or strain is its yield and quality of grain. Yield in turn depends largely upon the ability of a variety to withstand adverse soil and weather conditions and to resist pests and diseases.

In the United States all commercial oat varieties belong to one or the other of two species, *Avena sativa* and *A. byzantina*. Varieties of the first group are important in the northern half of the country and those of the second group in the southern half. The two groups overlap considerably throughout the central areas.

Oat varieties grown in the northern half of the United States usually are grouped first according to whether the panicle is of the spreading (equilateral) or side (unilateral) type. The latter type is usually considered a subgroup under *Avena sativa* and designated

Avena sativa orientalis. Varieties with spreading panicles are the more important; in fact, side oats are almost obsolete in many sections because of their inferior yield and quality. Varieties are further classed within the groups according to the time of maturity, as early, midseason, and late. Nearly all varieties with side panicles are rather late. After classification according to time of maturity, a further grouping is made on the basis of kernel color, that is, the color of the hull or lemma. Most of the oats of the common group have yellow or white kernels. Those with black kernels are less important than formerly, because of market discrimination.

Varieties of the second species, *Avena byzantina*, the red oats, are grown in the South. These are much less diversified than the common or northern group. Side-panicle varieties of this group are not known in the United States.

Northeastern Region

Midseason varieties of oats such as Silvermine, Swedish Select, Irish Victor, and Welcome are standard in the Northeastern States. Late side-panicle varieties such as Mammoth Cluster and Storm King also are grown in some sections, but are not considered entirely satisfactory. Improved varieties and strains, superior in many characters, are replacing the older sorts. Maine No. 340 is now extensively grown in Maine and to a lesser extent in other New England States. Its high yielding power combined with excellent grain quality and a fairly stiff straw have met with favor. The Gopher variety, developed at the Minnesota station, also is proving well adapted to conditions in Maine.

In New York two of the most productive improved varieties are Cornellian and Upright. Cornellian grows rather tall and produces slender, awnless, gray kernels. It can easily be identified and maintained in pure condition. Cornellian is an excellent variety to be grown in combination with Alpha barley for a grain mixture, both ripening at approximately the same time. Upright is a white oat of excellent quality, with a very stiff straw. Its ability to resist lodging makes it very desirable for growing on dairy farms where soils usually are fertile because of heavy manure applications. Other new varieties of merit adapted to New York and adjacent States are Ithacan and Standwell. Keystone and Patterson are replacing the older and less productive sorts in Pennsylvania. Victory, introduced from Sweden about 25 years ago, also is highly productive and is very satisfactory throughout much of the northeastern region.

North Central Region

Many varieties of oats are grown in the North Central States. Early Champion and Burt formerly were grown extensively in the Corn Belt. Early Champion is susceptible to the smuts of oats, lodges easily, and is a poor yielder. Burt lacks uniformity in plant characters and produces grain of inferior quality. These varieties were largely replaced by Kherson and Sixty-Day, introduced from Russia. These two, with the various selections developed from them, now make up the most important group of oats grown in the Corn Belt and therefore in the United States. Oat production in this region has always been reduced by stem rust. Of the new varieties of the Kherson-Sixty-Day

group, Richland and Iogold are outstanding because of their high resistance to this disease. Other high-yielding and extensively grown selections of Kherson or Sixty-Day are Albion, Iowar, Gopher, Nebraska No. 21, and State Pride.

Green Russian, Lincoln, Swedish Select, Great American, and many other midseason varieties have been standard in the northern part of this region. Victory and Golden Rain are now important. Numerous high-yielding and high-quality strains of midseason oats have been developed and distributed in this region. Miami and Wayne are proving superior in yield and standing ability to most of the older sorts in Ohio. Wolverine and Worthy are stiff-strawed, highly productive varieties, extensively grown in Michigan. Similar productive and desirable varieties are Forward and Wisconsin Wonder in Wisconsin, Iogren in Iowa, Minota and Anthony in Minnesota, and Rainbow in North Dakota. Anthony and Rainbow are highly resistant to stem rust, which fact contributes much to their productiveness. They are replacing the low-yielding late side oat White Tartar, which because of high resistance to stem rust has persisted in the Red River Valley.

Central Region

Red-oat varieties are mostly grown in the central region, although early common oats are grown to some extent along the northern edge. Formerly only strains of Burt and Red Rustproof of the red-oat group were available for growing in this region. These, as well as the better common varieties, were not altogether satisfactory. As previously noted, Burt lacks uniformity in plant and kernel characters and produces grain of poor quality. Red Rustproof matures too late and is very susceptible to stem rust. It also produces numerous awns and possesses other undesirable kernel characters. Fulghum, an early high-yielding red oat having more desirable kernel characters than either Burt or Red Rustproof, came into prominence in this region during the decade beginning with 1920. Kanota, a strain of Fulghum distributed by the Kansas station, is to-day the most popular and extensively grown variety in the region. Brunker, an improved uniform strain of Burt, is suitable where a variety still earlier than Fulghum is desired.

Southern Region

As in the central or spring-sown red-oat region, strains of Red Rustproof and Fulghum are grown almost exclusively in the Southern States, mostly from fall seeding. Named strains of Red Rustproof such as Appler, Bancroft, and Red Texas have been standard for many years. Improved strains of Red Rustproof such as Nortex and Ferguson No. 922 are superior in yield to the older strains for that portion of the southern region west of the Mississippi River. Fulghum is of first importance, particularly in the eastern part of the southern region. Its early maturity and greater freedom from awns add to its popularity among farmers. Frazier, a selection of Fulghum, is suitable for spring seeding in northeastern Texas. Lee, a new winter common oat, is well adapted in North Carolina and Virginia where this type of oats is grown. Lee is earlier and produces grain of better quality than Winter Turf, heretofore the standard variety in this section. In the extreme southern part of the southern region, oat production is seriously limited by severe attacks of oat crown rust. Until recently no varie-

ties resistant to this disease have been available. Within the last few years certain foreign varieties, including Victoria and Bond, have been introduced, and are highly resistant to this disease. It is possible that some one of these new strains may prove adapted in itself, and it is certain that they will offer material for breeding crown-rust-resistant, well-adapted varieties.

Western United States

In the western part of the United States, which is made up of the Great Plains, Rocky Mountain and Intermountain, and Pacific regions, the varieties of oats grown are similar to those adapted to the regions to the east. In the northern part of this area, standard midseason varieties such as Victory, Swedish Select, and Banner predominate. For growing under irrigation the highly productive sorts, Colorado No. 37, Victory, and Idamine are used. Markton, a comparatively new smut-resistant and high-yielding variety, is replacing the older standard sorts in Oregon, Washington, and Idaho and the adjacent part of Montana. Markton is one of the most productive varieties ever developed, but because of its extreme susceptibility to the rusts of oats it is not suitable for areas where the rusts are prevalent. In the central and southern parts of this area, early common and early red varieties are the most productive. Fulghum and the improved strains of Kherson and Sixty-Day are most commonly grown. In recent years, Kanota has become important in California because of its earliness. It is superior in yield to the old California Red variety.

T. R. Stanton, *Bureau of Plant Industry.*

GRAIN Sorghums Highly Drought Resistant; Many Varieties Grown in U. S. At least 40 varieties of grain sorghum are grown on farms in the United States. These varieties differ widely in adaptation, maturity, height, head and grain type, and in the utilization of the crop. Except for a limited number of miscellaneous and hybrid varieties, they can be classified into distinct groups such as kafir, milo, feterita, hegari, and durra. Kafir and milo are the classes most widely grown and most frequently sold on the market.

Texas, Oklahoma, Kansas, New Mexico, and Colorado are the leading States in the production of grain sorghums, but considerable quantities also are grown in Missouri and Nebraska and in the irrigated valleys of California and southern Arizona. The grain sorghums are grown principally in sections too dry or too hot for successful corn production, where the average rainfall is less than 25 inches annually. They are able to withstand the effects of dry, hot weather better than do most other grain crops. The plants can remain dormant during periods of drought and resume growth when moisture becomes available, unless the drought is too prolonged. Grain sorghums are sometimes called the "crop camel" because of this ability.

Uses

The grain sorghums are grown principally for feeding to all classes of livestock on the home farm. They take the place that corn occupies in a good corn-producing section. They are grown largely for

their grain, although some are important also as forage crops. Milo and durra are grown almost exclusively for grain, and the stover seldom is utilized except in a limited way as pasture. Hegari and kafir are grown for forage as well as for grain, and considerable quantities are fed as a combined forage and grain ration, either in cured bundles or as silage. Kafir and hegari are more leafy and juicy than milo, durra, and feterita, and when the heads are harvested and threshed, the stover usually is saved for feeding. Grain sorghums have a feeding value nearly equal to that of corn and can satisfactorily replace corn in most rations.

Only a small percentage of the grain-sorghum crop is threshed and shipped to market. That which reaches the terminal markets is sold largely for poultry feed or in ground mixed feeds for livestock. Durra, grown almost entirely in California, is largely fed by poultrymen in that State. Considerable milo and some kafir also are shipped into the poultry districts.

Place in Cropping System

Grain sorghums do not usually enter into a regular rotation system, as crops following sorghum usually are poorer than those grown after other crops. Occasionally grain sorghums are grown in rotations with wheat or cotton, but usually they follow either corn or another sorghum crop. In the southwestern irrigated regions they are often planted on land from which a crop of wheat or barley has been harvested the same season. In many localities they are not an important cash crop but are grown often in small fields, mostly to be fed on the farm. Either wheat or cotton is the leading cash crop in the counties in which grain sorghums are grown; but in many localities, mostly on sandy soils, the grain sorghums are an important source of income. Grain sorghums have not yet been able to displace wheat to an appreciable extent on the large-scale farms of the southern Great Plains, because of their lower cash value and the greater labor in growing and harvesting them by the common methods followed.

Machine Harvesting of Grain Sorghums

The harvesting and threshing of grain sorghums by ordinary methods requires considerable hand labor. In order to avoid losses and increased harvesting expense from lodging, the grain sorghums usually must be harvested promptly after maturity, and where they are grown on a large scale this necessitates hiring much more labor than is required for wheat or corn. The Department of Agriculture has recently developed varieties suitable to be harvested with a combine or a grain header, so that farmers may grow large acreages of grain sorghum without excessive hiring of labor for harvest. The breeding experiments were begun more than 12 years ago. The object has been to produce varieties with erect heads and short stalks, that are not subject to lodging after maturity. It was found that the desired type could not be obtained by ordinary selection methods, and hybridization was used. Simple crossing failed to produce the desired type, and recrossing the most promising hybrid strains with the milo parent was resorted to. As a result of this breeding work, carried on largely at Woodward, Okla., and cooperatively at Hays, Kans., there have been developed a number of erect, low-growing varieties of the desired

type. One of these, Beaver milo, produced by crossing milo with a selection from a kafir-milo hybrid, was distributed to farmers in Oklahoma in 1928 and is now grown on many thousands of acres in Oklahoma, Kansas, and Texas. A kafir-milo hybrid called Wheatland milo was distributed to farmers in Kansas and Oklahoma in 1931 and is now extensively grown, particularly in Kansas. Other varieties of the so-called "combine type" are being tested with the possibility that some of them will prove superior to both Wheatland and Beaver.

Early-Maturing Varieties

Grain sorghums frequently fail to mature in northwestern Kansas, northeastern Colorado, and western Nebraska because of cool weather and short seasons occurring at the high altitudes or northern latitudes. In much of this region the rainfall is too scanty for successful corn production or for heavy-yielding grain sorghums. The Department of Agriculture, in cooperation with the State stations, is giving considerable attention to breeding varieties that will mature earlier and will grow in relatively cool summers. Such early varieties also should partly escape drought injury and so fill a need in the dry portions of the west-central Plains. An early white-seeded variety called Dwarf Freed, selected at the experiment station at Hays, Kans., was distributed to farmers in Kansas in 1927. Several other new kafir, milo, and hybrid types also have been developed for short-season conditions and experiments are being continued to determine their value and adaptation in various localities before they are distributed.

Controlling Diseases

Experiments have shown that kernel smut in sorghums can be controlled by the use of fungicide dusts such as copper carbonate and Ceresan. There are several different physiological forms of sorghum kernel smut, but all can be controlled by seed treatment. These treatments also are effective in lessening the injury from seed rots that frequently reduce the stands of grain sorghum seriously. Some varieties that show considerable resistance to smut are very susceptible to seed rots, and consequently it has been found advisable to treat all grain-sorghum seed before planting unless it is known to be free from smut and is to be planted in a warm soil.

Controlling Insects

Date-of-planting experiments covering several years at Lawton, Okla., have shown that injury from chinch bugs is largely reduced by early planting. Planting in June under serious chinch-bug infestation usually results in a complete failure, although June planting has given the best results in much of the grain-sorghum area where chinch bugs are not usually numerous enough to be injurious. There are wide differences in the susceptibility of grain-sorghum varieties to chinch-bug injury. The milos are particularly susceptible, feterita and hegari somewhat susceptible, while the kafirs shows considerable resistance. Many hybrid sorghums have been tested for resistance to chinch-bug injury, and a few strains that possess a resistance greater than that of either parent have been found.

Cultural Methods

Extensive experiments have shown that grain sorghums usually produce the best yields of both grain and forage when planted after the soil is warm. Better stands also are secured under these conditions. In most localities best results have been obtained from planting after June 1, and in western Oklahoma and Texas planting about June 15 often produces the highest yields. North of Oklahoma, where the season is somewhat shorter, it often is necessary to plant before June 15 to permit the grain to mature before frost. Also, as mentioned previously, where insect injury occurs it is necessary to plant early in order to avoid damage by the pests.

Late varieties should be planted somewhat earlier than early-maturing varieties, in order to reach maturity. In general, it appears desirable to have grain sorghums come into head after the period of extreme heat and midsummer drought.

Studies of different spacings of grain sorghums have shown that varieties that tiller freely can be planted in wider spacings than varieties that tiller but little. Except under conditions of extreme drought, the sparsely tillering kafirs should be spaced about 6 inches apart in ordinary cultivated rows, while milo plants, which tiller freely, may be spaced about every 18 to 24 inches in a row. Beaver milo, which tillers poorly, should be spaced about as thickly as kafir.

Recent experiments in planting grain sorghums with the furrow or lister drill used for wheat have shown that under certain optimum conditions this method of planting in rows 12 or 14 inches apart has been satisfactory. Such planting has been successful, however, only in clean soil where weeds do not become numerous without the usual intertillage and where the rate of planting has not exceeded 4 or 5 pounds of seed per acre. Thicker planting may result in overcrowding of the plants and decreased yields.

JOHN H. MARTIN, *Bureau of Plant Industry.*

SOYBEANS Now a Major Crop in United States; Few Grown Before 1898

Introduced into the United States in 1804, the soybean has risen gradually from the status of merely a curiosity from the Far East, and from the lowly place of a substitute and emergency crop, to a position of considerable economic importance in American agriculture and industry.

Variety Adaptation

Prior to the introduction of numerous varieties by the United States Department of Agriculture in 1898, not more than eight varieties of soybeans were grown in the United States and the culture of these was limited to a few sections. With new varieties adapted to a greater range of soil and climatic conditions, acreage gradually increased and the crop became of major importance.

Knowledge of variety adaptation is one of the outstanding results of investigations carried on throughout the United States. The mass of data collected in varietal studies with hundreds of introductions shows that with but few exceptions soybean varieties have limited soil and climatic adaptations. The Virginia, Laredo, Manchu, and Biloxi have

a greater range than most other varieties. The Virginia, Mansoy, and Harbinsoy varieties excel on the less productive types of soil, while on better soils the Mansoy and Harbinsoy give inferior results. Such results are in accord with those found during agricultural exploration studies in the soybean regions of the Orient and indicate the reason for the vast number of varieties grown there. Small regions appear to have varieties particularly adapted to their own soil and climatic conditions. For the most part, Japanese varieties are unsuited to Manchurian and Chosenese (Korean) conditions, and, on the other hand, few Manchurian and Chosenese varieties are suited to Japanese conditions. Very few Chosenese varieties are adapted to the climate and soil of Manchuria. The soybean seems to be peculiarly sensitive to change of soil or climate. The differences in behavior of the same pedigreed seed in different places are often very striking, so much so that it is sometimes difficult to believe that it is the same variety.

Since the Department of Agriculture began to introduce soybean varieties more than 7,000 samples of beans have been collected from Japan, Chosen, Manchuria, China, Taiwan (Formosa), Java, Sumatra, and India. There are more than 2,000 distinct types in this large collection, ranging from 75 to more than 200 days in reaching maturity. At present about 40 varieties are generally grown in the United States. In many regions adaptation experiments comparing commonly grown varieties with new introductions indicate that the new types are better adapted than the standard sorts, and it seems likely that varieties that suit requirements in nearly all farming regions of the United States will be found. Although it would be highly desirable to limit the number of varieties in trade, unfortunately each region must have varieties especially adapted to it in order to obtain the best results. Studies to meet this requirement are now under way at various experiment stations.

Variety Utilization

Centuries of experience have brought about the development of soybean varieties suitable for special purposes in oriental countries. In China, Japan, Manchuria, and Chosen varieties especially suited for bean curd, bean milk, soy sauce, miso (bean paste), bean sprouts, green vegetable beans, bean flour, roasted beans, bean confections, beverages, oil and meal, and special fermented bean products, are found. Different regions in these countries have different varieties for these special purposes. In Japan, where the soybean is used extensively as a green vegetable, more than 60 varieties, ranging in maturity from 75 to 160 days and differing in flavor, are grown solely for this purpose.

The soybean is used in the United States primarily as forage, being preserved either as hay or silage, or cut and fed green as soilage, and is also pastured extensively with hogs and sheep. Breeding work heretofore has tended toward the development of varieties suitable for forage, silage, and pasture. Undoubtedly the use of the soybean for forage will continue to grow; but with the rapid development of the soybean oil and food industries, future increase in acreage probably will be largely for the production of beans. In the development of new varieties, therefore, more attention is being given to the oil, protein, nutritive value, bean yield, and quality of the beans.

A soybean oil and protein laboratory was established in 1929 by the Bureau of Plant Industry to conduct investigations looking toward the

development of high-oil and high-protein varieties and low-oil varieties. The oil-milling industry demands a high-oil and high-protein bean, whereas hog producers require varieties with low oil content to avoid the soft pork that results from pasturing and feeding hogs on soybeans. Results with more than 1,000 selections and varieties show a range of 12 to 24 per cent in oil and 28 to 44 per cent in protein. Analyses of a large number of selections and introductions also show varieties with both high oil and comparatively high protein contents. Although American beans excel Manchurian beans in oil, the protein content is lower in the domestic product. Studies of soybean proteins have shown that they contain all the essential amino acids but further experiments with several standard varieties of soybeans showed considerable differences in percentages of the amino acids cystine, trypotophane, and tyrosine. These results indicate possibilities of developing varieties having high nutritive value and suitable for stock feeds and human foods.

Soybean Oil and Meal Industry

The soybean did not attain commercial importance in the United States until the soybean-milling industry was developed after the World War. Soybean-oil mills are now located in 10 States and have an annual crushing capacity of 10,000,000 bushels of beans. Two processes are used in the manufacture of oil from the soybean. The oldest method is by expression, in which the hydraulic press or expeller is used. In the other method the oil is extracted by some chemical solvent. By the extraction process nearly all of the oil is extracted, only 0.5 per cent remaining in the meal. Cake or meal made by expression contains from 5 to 8 per cent of oil. Most American mills employ the expeller or hydraulic processes, very little extracted meal being produced in the United States.

The two chief products of the soybean-oil mills are soybean meal, a high-protein concentrate, and soybean oil, a semidrying oil. The meal is considered the principal product from the oil-mill standpoint and constitutes about four-fifths of the combined weight of the two products.

Soybean Meal

Many investigators have demonstrated that equal amounts of protein from different sources may not be equal in nutritive value. The value of a protein for feeding depends, it has been shown, on the amount of certain amino acids. It has been demonstrated that soybean protein has a high biological value as compared with those of many of the other vegetable proteins.

The best-quality soybean meal is a highly nutritious and palatable product having a nutlike flavor relished by all farm animals. It has a good distribution of amino acids and is recognized as a well-balanced vegetable protein. It is highly digestible and has a very desirable physical effect on animals. As the valuable properties of soybean meal are becoming better known it is growing in popularity as an ingredient of mixed feeds and for improving home-mixed rations for poultry, dairy cows, beef cattle, hogs, and sheep. It is also used extensively in the manufacture of dog and rabbit feeds.

The high oil content of soybeans that makes them commercially desirable is a definite obstacle to their extensive use in swine feeding.

Investigations have shown that because of their detrimental effect on the firmness of pork and lard they should not be used extensively in rations for fattening hogs. Experiments indicate that soybean meal, however, is a most promising protein supplement for growing and fattening swine, and objections to the beans do not apply to the meal, which is also apparently more palatable than the beans.

Extensive feeding experiments in the United States and several European countries show that soybean meal as a protein supplement in the dairy ration is equal to or superior to cottonseed and linseed meals in milk and butterfat production. In 1931 the approximate quantities fed per head of cattle in the three leading dairy countries of Europe were, in the Netherlands, 1,309 pounds; in Denmark, 1,056 pounds; and in Germany, 396 pounds. If dairymen in the United States were to feed soybean meal in the same ratio, the soybean would furnish a very considerable cash income to the soybean regions and at the same time would establish permanently the new and growing soybean-oil milling industry.

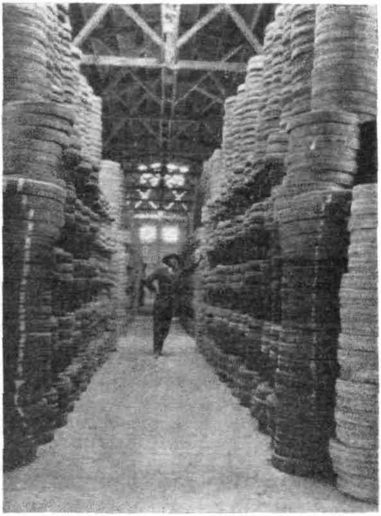


FIGURE 24.—Soybean-meal cakes stored in a warehouse in Manchuria awaiting shipment to Japan, China, and the East Indies for fertilizing purposes

The high fertilizing value of soybean meal has long been recognized in oriental countries. In 1930 Japan imported from Manchuria 1,087,476 tons of soybean cake, 90 per cent of which was used as fertilizer in rice paddies, mulberry plantations, and for truck and field crops. (Fig. 24.) Soybean meal is also used extensively for fertilizer on the sugar plantations and other field crops in southern China, Taiwan, the Philippines, Java, Sumatra, and other tropical islands. Although soybean meal has been imported in large quantities by the United States for many years, but little has found its way into the manufacture of commercial fertilizer.

Soybean meal is gradually assuming importance in industrial utilization. Considerable quantities are going into the manufacture of vegetable glue and adhesives used principally in the manufacture of veneer, plywood, and insulating materials. In many instances it replaces animal glue, and its use in this field is rapidly expanding. Other prod-

ucts in which it is employed are water paints, bakelite substitute, and vegetable casein.

Many food concerns are utilizing the meal in manufacturing flour, diabetic foods, breakfast foods, malted milk, and health foods.

Soybean Oil

Soybean oil, representing about one-fifth of the combined weight of the principal products, has a more diversified use than has any other vegetable oil. It is classified as a semidrying oil and possesses a combination of properties that qualify it for use in a wide variety of manufactured products such as cooking oils; vegetable shortenings; oleomargarine; salad oils; soft, liquid, hard, and powder soaps; cleaning compounds; disinfectants; foundry oils; paints; varnishes; enamels; lacquers; linoleum; oilcloth; printing ink; grease and lubricating compounds; rubber substitutes; patent and artificial leather; putty; waterproof fabrics; glycerin; candles; and lecithin.

In the beginning of the domestic soybean-oil industry consumers developed strong prejudice against domestic crude oil, which was said to be inferior to the Manchurian product. This prejudice has been entirely overcome through the setting up of trade rules and quality standards. With improvement in processing and in methods of handling and storing, domestic oil is now preferred to the imported oil by consuming industries, especially in the edible-oil trade. The largest consumption of soybean oil in 1931 was by the edible-oil industries, chiefly in the manufacture of compounds and vegetable shortenings; the paint and varnish, soap, linoleum, and oilcloth industries were next in order in consuming soybean oil.

Soybeans for Human Food

In Asiatic countries the soybean is grown primarily for the beans, which are used largely in the manufacture of numerous food products that supply the principal source of protein in the Asiatic diet as that in the diet of western people is furnished chiefly by meat and dairy products. Oriental people use very few dairy and meat products, yet for many centuries they have lived on an apparently well-balanced diet of which the protein is derived largely from the soybean. The most commonly used soybean foods in the Orient are soy sauce, miso or bean paste, bean curd, bean milk, bean flour, roasted-bean confections, green-vegetable beans, bean sprouts, roasted bean flour, boiled beans (with rice, millet, or sorghum), coffee substitute, and health drinks made from roasted soybeans.

In the United States the soybean and its products have attracted attention as an article of food at various times, but only within the last three or four years have there been any extensive investigations along this line by commercial interests. Soybean flour, made by grinding either the whole bean (preferably yellow-seed varieties) or the press cake after the oil has been removed from the beans, is finding increasing favor in the manufacture of various products, such as malted milk, macaroni, vermicelli, spaghetti, noodles, crackers, cookies, ice-cream cones, breakfast foods, health foods, diabetic foods, and infant foods. Within the last year several large baking companies have began using 15 to 20 per cent of soybean flour in making bread and cakes.

When soybeans are fully developed the beans make a palatable and nutritious green vegetable, used in the same manner as the green pea or the Lima bean. (Fig. 25.) The pods are tough and not desirable, but if the beans are boiled for about three minutes they are easier to shell. Use as a green vegetable is one of the most important food uses of the crop. Many varieties have been developed in Japan solely for use as green beans and are classed by seedsmen and growers as garden beans. About 60 of these varieties were collected in recent explorations by the Department of Agriculture in Japan. These varieties, ranging from 75 to 160 days in time required for maturing, differed markedly in flavor, quality, and adaptation. The green-vegetable soybean serves as a substitute for green beans in localities where the Mexican bean beetle prevents the growing of garden beans. Soybeans are sometimes lightly attacked by this pest, although it evidently prefers other legumes. Green-vegetable soybeans have been successfully

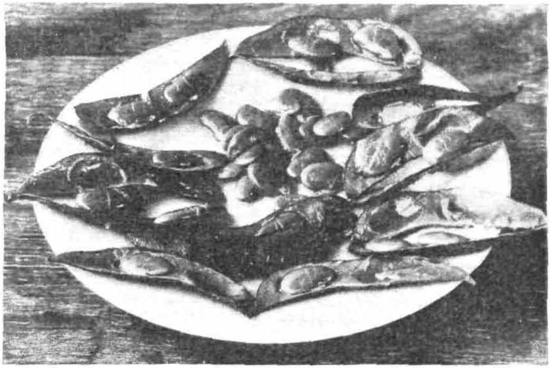


FIGURE 25.—Some varieties of the soybean when three-fourths to full grown make a most palatable green-vegetable dish

canned like green peas, and offer a new and valuable food product to the canning industry.

Sprouts (fig. 26) grown from soybean seed are used extensively in oriental countries as a green vegetable in a great variety of dishes. During the last five years mung-bean sprouts have become very popular throughout the United States, but soybean sprouts are more palatable and nutritious than those of the mung bean. Small-seeded varieties of soybeans especially desirable for sprouts have recently been introduced from the Orient, and tests indicate that a product superior to that of the mung bean can be produced in the United States.

Shoyu or soy sauce is a dark-brown liquid prepared from a mixture of steamed soybeans, cracked roasted wheat, salt, and water. It has become exceedingly popular with Americans and has found a large commercial outlet in the United States. At present only one factory in the United States manufactures soy sauce from domestic-grown beans. Other soy sauce used here is imported.

Soybeans as an Export Crop

The United States did not become an exporter of soybeans in quantity until 1931, when, because of unsettled conditions in the Orient, European importers of soybeans turned to the United States, and more than 2,000,000 bushels of America's 1931 soybean crop were exported to European oil mills, mainly those of Germany. Prevailing low prices placed American soybeans on a competitive basis with the Manchurian crop. American beans received in the European market are reported to have arrived in a much cleaner and more uniform condition than the Manchurian beans. The uniformly bright yellow color of American beans created most favorable comment and caused them to be rated as superior to all competing beans. The fat content of American beans was 19 per cent, while the Manchurian bean averaged 18 per cent; the protein content of American beans was 35 to 36 per cent, and the average of the Manchurian beans 38 per cent. As soybean meal is sold in Germany on the basis of a 46 per cent protein plus fat content, the lower protein content of the American bean is a handicap in the export of beans to German oil mills.

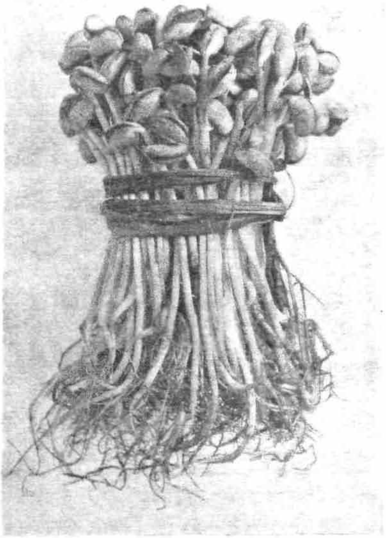


FIGURE 26.—Sprouts grown from soybean seed furnish an excellent green vegetable for a great variety of dishes

The success achieved by the recent large exports of beans to European markets indicates a new outlet for the American product. It must be remembered, however, that prices for the American beans must be on a basis competitive with the prices of Manchurian beans. European importers emphasize the fact that the European trade requires a large tonnage of soybeans continuously, and they demand the assurance of a source of supply as dependable as Manchuria's. It is doubtful whether the United States can compete with Manchuria if American exporters turn to the European market only when a surplus domestic crop must be disposed of. On the other hand, the domestic soybean-oil-milling industry, which no

doubt has sustained more or less loss in developing the industry and creating new markets for the manufactured products, is brought into competition with the European buyers. Undoubtedly, with higher price levels for the products, the domestic mills can build a permanent cash market for the American bean.

W. J. Morse, *Bureau of Plant Industry.*

PASTURE Experiments Point Way to More Profitable Grazing

Almost from the beginning of agriculture in the United States, this country's pastures have been confined for the most part to land that was too rough or was otherwise unsuited to the production of farm crops. These pastures and ranges contribute approximately 50 per cent of the feed required to maintain our livestock, and this feed costs much less than harvested feed. Present prices of milk and meat demand low production costs and therefore require that as much of the feed as possible be obtained from pastures. This has made it necessary, especially in sections where milk is one of the main sources of farm income, to utilize for grazing some of the better land formerly used for cash crops. Interest in pasture improvement is widespread, and during the last few years much experimental work on pastures and various grazing crops has been started by the United States Department of Agriculture and the State agricultural experiment stations. Some of the results already obtained indicate ways in which larger returns from grazing lands may be obtained.

Improvement of Permanent Pastures

A judicious use of commercial fertilizers is generally recognized as the most effective way of increasing the productiveness of established pastures. Fertilizer benefits the pasture in several ways: (1) By lengthening the grazing season; (2) by changing the botanical and chemical composition of the plant populations; (3) by increasing the palatability of the pasturage; and (4) by stimulating or increasing the growth of the herbage.

At Beltsville, Md., an application of complete fertilizer produced good pasture two weeks earlier than the pasture on the unfertilized check plot. Numerous reports from other localities indicate that this additional period of grazing in the spring may be expected whenever there is sufficient soil moisture. The percentage of legumes in the herbage may be increased by applications of phosphate and potash or decreased by heavy nitrogen applications. In either case the cattle relish the herbage on the fertilized areas more than that on the unfertilized areas.

The soils in the majority of old pastures in the humid regions are deficient in plant food, consequently the forage is likewise low in the nutrients needed by animals for building body tissue and producing milk. *Poor quality feed naturally produces an inferior quality and quantity* of meat, milk, and wool, as well as an increase in the malnutrition troubles and diseases to which livestock is subject. That such difficulties can be remedied, at least partially, by fertilizer and lime, is shown by the results at Beltsville, where applications of lime gave an increase

of 22 per cent in the calcium content of Kentucky bluegrass, nitrogen increased the protein 30 per cent, and phosphorus increased the phosphorus 56 per cent in the dry matter of this grass grown on Sassafras silt loam soil.

An application of 600 pounds per acre of 6–12–6 fertilizer at Beltsville, gave, as an average for three years, 29 per cent greater annual yield from a pasture mixture. At Tifton, Ga., the same quantity of fertilizer produced a 2-year average increase of 85 per cent for Bermuda-grass, 80 per cent for carpet-grass, and 148 per cent for centipede-grass pastures; and at Gainesville, Fla., 50 pounds per acre of nitrogen gave as a 3-year average increase of 73 per cent for carpet-grass, 44 per cent for Bahia-grass, and 86 per cent for centipede-grass pastures. At Jeanerette, La., an application of 2 tons per acre of ground oyster shell in 1929, and 150 pounds per acre annual application of superphosphate, gave an increase in 1931 of 25 per cent in the unit-days of grazing and the average daily gain of the steers on the pasture. The net returns per acre were $9.15 for the unfertilized and $13.29 for the fertilized pasture, an increase of over 45 per cent in the profit

Effects of Fertilizers on Northern Pastures

That fertilizers were useful in improving the old and also the newly seeded pastures in the more humid sections of the North has been recognized for several years, but it is doubtful whether their full value is realized. Grazing experiments at Kylertown, Pa., in which fertilizers containing (1) nitrogen, phosphorus, potassium, and lime, (2) phosphorus, potassium, and lime, (3) phosphorus and lime, and (4) lime alone, gave gains in weight, in dairy heifers, that ranged from 48 per cent increase for the use of phosphate and lime over lime alone to 140 per cent for the use of phosphate, potash and lime, and from 130 to 345 per cent when nitrogen was applied in addition to phosphate, potash, and lime. The increases depended on the quantity of nitrogen per acre. It is very evident that nitrogen greatly increases the production during the spring and early summer, making the need for supplementary grazing crops even more acute during the midsummer season. The use of nitrogen can not compensate for the effects of heat and drought, although the use of phosphate and potash in combination does tend to furnish more uniform grazing throughout the season, mainly by means of the increased amount of white clover on the pastures. Using nitrogen in addition to phosphate and potash, when enough nitrogen is applied to give material increase in grazing, practically excludes the clover. Kentucky bluegrass is dominant on pastures heavily fertilized with nitrogen, and the heavy grass turf keeps out the white clover. The use of fertilizers on pasture plots in West Virginia and Vermont produced increases in forage very similiar to those in Pennsylvania.

Results in Vermont indicate that when the turf of a permanent pasture consists mainly of plants that have little or no grazing value, it is advisable to disk the sod thoroughly in the fall, provided, of course, it is possible to use machinery. A liberal application of superphosphate and potash, as well as manure if it is available, should be disked into the soil. If these operations can be completed in the fall, a mixture of pasture grasses and clovers should be broadcast over the land very early in the spring. If the seed can be scattered sufficiently early it will not be necessary to cover it with a smoothing harrow, as the

freezes and thaws of early spring will cover it sufficiently for germination. If manure is not available, a nitrogen fertilizer such as sulphate of ammonia or nitrate of soda, applied at the rate of 150 to 200 pounds per acre after the grass has emerged, will prove of great value in furnishing earlier and more abundant grazing.

Carpet-Grass Pastures

In many of the carpet-grass pastures of the Gulf States the turf is so thick as to make it practically impossible to maintain a proper proportion of legumes. Lespedeza, black medic, hop clover, and bur clover are crowded out by carpet grass, and the turf becomes so thick in old pastures that the growth of the grass itself is unsatisfactory. An admixture of legumes in carpet-grass pastures not only opens up the turf but increases the vigor of the carpet grass through the nitrogen in the legume nodules, while the herbage with a proper percentage of legumes is more nutritious.

Cluster clover, also known locally as McNeill clover, has been under observation at McNeill, Miss., since 1922 and appears able to maintain itself in carpet-grass turf. If it is found to be adapted to any considerable area in the Gulf States it will lengthen the grazing season and increase the productiveness and nutritive value of many permanent pastures. This new clover is a winter annual which reseeds itself naturally in the same way as do the hop clovers. The seeds germinate in the fall and the plants live over winter, make a rapid growth the following spring, and mature in May or June. Cluster clover may be grazed from late February until June, its productive season ending about the time that of Lespedeza begins. Cattle, sheep, and hogs relish it both as pasturage and as hay.

The most reliable pasture plants in the Cotton Belt States are Bermuda grass, carpet grass, Dallis grass, common Lespedeza, and white clover. Bur clover, hop clover, and black medic are well known and abundant in some localities, where they add considerably to the pasturage. A proper use of these plants insures good pastures in favorable situations such as moist bottom lands and on the better upland soils. In developing good pastures the main difficulty is encountered on poor upland soils. Woolly finger grass, a new importation from South Africa, seems most promising for such situations. It thrives at Tifton, Ga., Gainesville, Fla., Auburn, Ala., and Jeanerette, La., and repeated tests in South Africa have shown it to be very drought resistant and able to make an unusually heavy growth on poor soils. It also has a fairly high nutritive value as shown by feeding tests. While it grows large enough to produce fair yields of hay, it will perhaps be most useful as a pasture grass. The greatest hindrance to its rapid spread and extensive use in the development of better pastures is its failure to produce viable seed. Although it is easily propagated from the stolons, which take root at the nodes and form clusters of new plants, establishing large fields of it by the vegetative method is a tedious process. Attempts are under way to segregate strains that will produce viable seed.

Supplementary Pasture Crops[7]

The grass that usually dominates the better type of pastures in the Northern States is Kentucky bluegrass. It is generally recognized that

[7] Detailed information on the culture and uses of any of these crops may be obtained from the U. S. Department of Agriculture.

bluegrass pastures reach their peak of production in the spring and early summer, after which production drops off rapidly in July and August, increasing again in the fall. The farmer who has sufficient pasture only when it is at the peak of production generally faces the problem of finding additional feed during the low-production period of midsummer. In all parts of the United States there are usually periods during the year when the permanent pastures are unproductive. By the intelligent use of certain less known pasture plants the returns from grazing may be greatly increased. Profits in meat as well as milk production are realized generally during the grazing season. An arrangement whereby the grazing period may be lengthened without undue expense will obviously extend the season of profits and shorten the interval of feeding, during which a loss is often sustained. The results obtained with certain crops, such as Sudan grass, sweetclover, and lespedeza, which may be used in providing additional pasturage, are indicated in the following paragraphs.

In a series of tests at Augusta, Mich., Sudan grass was outstanding in the years 1929 to 1931, inclusive, giving an average of approximately 425 sheep-days of grazing per acre, which is 50 per cent more than that secured from any other crop in the test, while gains per acre were even more outstanding. Soybeans were not included in the test until 1932, consequently no comparisons involving soybeans are yet available. The grazing seasons of 1929 and 1930 were very dry, but the Sudan grass gave excellent grazing from June to September. During much of this time the permanent pastures were dry and furnished practically no grazing.

Sudan grass makes rapid growth and is very drought resistant. The seed is reasonable in price, a stand can be secured with little trouble, and the grass produces a high yield of palatable feed, all of which facts make it a very satisfactory pasture crop and particularly valuable as a supplementary pasture crop to be used when permanent pastures are nonproductive. The only drawback in its use is that after being damaged by frost or, less frequently, when severely checked by drought, it sometimes contains dangerous amounts of prussic acid, and precautions should be taken in grazing under such conditions. Sudan grass, although not introduced into the United States until 1909, has been used extensively for both pasture and hay for several years and has been grown to some extent in every State, but has reached the highest degree of utilization in the States just west of the Corn Belt. Its use for grazing is increasing rapidly in the northern tier of States east of the Mississippi River and in New England, as its value in furnishing cheap grazing is being recognized. Detailed information about Sudan grass is given in Farmers' Bulletin 1126.

Lespedezas Have Important Uses

All the lespedezas have a distinct field of usefulness because of their ability to grow on acid soils. Korean lespedeza is considerably earlier than the common and is apparently best adapted to the climate of the States just north of the Cotton Belt, including the piedmont section of North Carolina, and Virginia, West Virginia, Tennessee, Kentucky, southern Indiana and Illinois, Missouri, eastern Kansas, northern Arkansas, and northeastern Oklahoma. The most effective method of utilizing Korean lespedeza for pasture is to grow it in rotation with a small grain. When once established by being seeded in the early spring

on fall-sown oats, wheat, barley, or rye, it will reseed itself each year if the land is disked rather than plowed each fall in preparation for seeding the grain. The small grain may be grazed, cut for hay, or harvested as a grain crop, and the lespedeza will be ready to graze June 1 to 15, maintaining one to two animal units per acre from that time until October 1 to 15, when the small grain must again be seeded. Such a field of Korean lespedeza is an excellent insurance against shortage of feed in periods of drought such as that of 1930. Its productive season coincides perfectly with the natural summer dormancy period of Kentucky bluegrass, and even in normal seasons it may be used to good advantage in supplementing the permanent pastures. A much wider use of this legume, which may be grown on poor acid soils where the

FIGURE 27.—Guernsey cattle grazing Korean lespedeza in the vicinity of Concord, N. C.

clovers and black medic do not thrive, is justified in the section indicated. Moderate applications of superphosphate are usually profitable on this crop. (Fig. 27.)

Kobe and Tennessee 76 lespedezas are improved varieties of common lespedeza, and both are later in maturing seed and in their early spring growth than Korean lespedeza. The Kobe is best for pasture south of Tennessee and North Carolina, where it may be grown and pastured in the same way as indicated for the Korean in the mentioned States. Good cuttings of hay are obtained from Kobe and Tennessee 76 lespedezas on fairly productive soils.

The lespedezas discussed above are all annuals. Although there are a number of perennial lespedezas growing wild in the eastern part of the United States, *Lespedeza sericea*, a perennial form introduced from Asia, appears to be superior to the native species. Its chief value lies in its ability to grow on a wide variety of soils that will not produce alfalfa or the clovers. So far the only soils to which it appears unadapted are light sands and heavy black soils which are inclined to be

wet. It is extremely drought resistant and has persisted on poor hillside soils through dry seasons when no other cultivated crop survived.

The pasture value of perennial lespedeza has not been fully determined. Cattle will graze the young plants, but do not appear to relish the mature plants. There are indications that it will not endure continuous heavy grazing even when well established. Care must be taken, therefore, to remove the animals at intervals to allow the plants time to renew their growth. If a system of intermittent grazing is practiced, it is believed that considerable pasturage of excellent quality may be obtained from this lespedeza on soils that now produce nothing but weeds and brush. In common with the annual lespedezas, this perennial species makes good hay when cut at the proper stage of growth.

A Rotation of Annual Pasture Crops

By seeding a proper succession of annual crops such as rye, vetch, soybeans, and Sudan grass on productive land, pasturage the year around is practically assured in the Cotton Belt. Such pastures are especially suited to dairy cattle, and the success of such a system has been demonstrated by a dairyman near Wilmington, N. C. Abruzzi rye sown about September 15 provides grazing from November 1 to March 15; hairy vetch or crimson clover sown August 1 to 15 may be grazed from March 1 to June 1; and Biloxi soybeans sown March 15 and again May 15 complete the grazing season, June 1 to November 15, if grazed properly. To accomplish this the soybean field is grazed in rotation, the cattle being confined to a limited acreage until they have finished that and then being moved successively to new areas. In this way soybeans may be grazed three times during the summer. This variety will leaf out twice after being defoliated by grazing animals. Sudan grass sown about May 15 is ready to pasture during the same period as the soybeans and may be cut for hay when not needed for pasture. It is always useful to turn the cattle in at night, and this greatly reduces the amount of stall feeding required. A similar system of annual pastures may be devised for States north of the Cotton Belt, but the difficulties in using a rotation of annual crops for pasture increase as one goes north. In the North such crops may be better employed to supplement the permanent pastures.

Other Useful Pasture Crops

Alfalfa is fast assuming a prominent place among crops used for permanent pasture. Where it is well adapted and grass pastures have become unproductive, the acreage of alfalfa being grazed is rapidly increasing. It has been found that danger from bloating can be minimized by proper precautionary measures, and the stand of alfalfa can be maintained by proper management.

In a grazing test now under way at Augusta, Mich., dairy cows are being used in an attempt to get the best returns from alfalfa without injuring the stand. Four methods of utilizing the alfalfa are being compared in the test: (1) Continuous grazing; (2) grazing the first crop and mowing the second; (3) mowing the first crop and grazing the second; (4) harvesting the entire field for hay. Both the economic results and the effect of the treatments on the duration of the stand are being compared. The test has not yet run long enough to justify definite conclusions, but results thus far indicate that it is more profitable to graze alfalfa with dairy cows than to raise alfalfa hay for market.

Alfalfa at Augusta, when grazed by sheep, has given much better results than have fertilized and unfertilized grass pastures, either seeded or on native sod. During the 1932 grazing season alfalfa provided 38 per cent more days of grazing and 51 per cent more gain than were obtained from permanent-grass pastures that had received the best treatment. Similar results had been obtained in 1931.

Crested wheatgrass (*Agropyron cristatum*), an introduction from the cold, dry plains of Russia, is admirably suited for the purpose of reconverting to grassland, fields that have been used for growing wheat.

During the World War many thousands of acres of grassland in the northern Great Plains area of the United States were plowed and devoted to wheat production. Falling prices after the war soon made it evident that wheat production in this area, with its limited rainfall, was a losing business, and the problem of reestablishing grass to control soil blowing and to furnish forage became acute. Many grasses and other plants have been tried, with crested wheatgrass, bromegrass (*Bromus inermis*), and slender wheatgrass (*Agropyron tenerum*) giving best results.

A stand of crested wheatgrass is easily secured, and the resultant sod is permanent. The grass is very resistant to both cold and drought, taking immediate advantage of showers that fall during the growing season. It is superior to bromegrass and slender wheatgrass in production, and the forage is palatable both for grazing and as hay. Crested wheatgrass will grow at a lower temperature than most other grasses, consequently it furnishes both early and late grazing. It is somewhat like Kentucky bluegrass in that the production drops during the heat of midsummer, making it advisable to grow a field of Sudan grass or other crop for supplementary grazing, or to seed an acreage of crested wheatgrass sufficiently large to provide grazing even in dry weather.

Preliminary grazing tests at the Ardmore, S. Dak., field station, show crested wheatgrass to be much superior to native range in carrying capacity and in producing gains on beef cattle. A considerable quantity of seed is now available. The acreage planted is rapidly increasing as its value for regrassing former cultivated areas of the Great Plains is recognized. The results of experimental work with crested wheatgrass, with instructions on planting and management of the crop are given in United States Department of Agriculture Technical Bulletin 307.

Rhodes grass, introduced into the United States many years ago, is best known in South Africa and Australia, and has been tested at many points in the Gulf States. In the more humid of these States it has never achieved any great success. It has become established, however, in southern Texas near Kingsville on the Gulf coast, and under the extremely dry conditions there it is an outstanding success. On one large ranch there are 9,000 acres seeded to Rhodes grass. Most of the seed is obtained from Australia by commercial dealers, but good seed is being produced on this ranch in quantities sufficient to satisfy the requirements of the ranch for new seedings. In early June, Rhodes grass in the pastures was green when the native grasses were brown and dry, and the manager of the ranch asserted that Rhodes grass would carry four or five times as many cattle per unit of area as would the best native pastures. Cattle relish it and are maintained in excellent condition while grazing on it. When not needed for pasture it

may be cut for hay, which has a good feeding value. A more extensive use of Rhodes grass in improving range pastures in southern Texas appears justified.

H. N. VINALL *and* C. R. ENLOW, *Bureau of Plant Industry.*
A. T. SEMPLE, *Bureau of Animal Industry.*

ALFALFA Losses From Bacterial Wilt Heavy; Resistant Kind Sought The alfalfa grower's greatest present problems are: (1) Bacterial wilt *Aplanobacter insidiosum* and its control; (2) adaptation of varieties and strains to various conditions, with special reference to cold and wilt resistance; and (3) the yellowing of alfalfa caused by the leaf hopper *Empoasca fabae.*

The most serious of these problems is bacterial wilt, which appears to be most destructive where conditions favor a vigorous growth of alfalfa. Although the disease has undoubtedly been in the United States a long time, the responsible organism was first isolated in 1925. Since then the disease has been reported in many States, and has caused serious losses in the Corn Belt, especially in Illinois, Wisconsin, Iowa, and in eastern Kansas and Nebraska. Recently it has been reported as assuming serious proportions in several of the irrigated districts of the Western States. It also occurs to some extent in the Eastern States, though seemingly less destructive there, possibly because alfalfa is usually grown in relatively short rotations.

According to census reports, the acreage of alfalfa in Kansas has declined from 1,315,507 acres in 1919 and 980,806 in 1924, to 729,622 in 1929. This represents a decrease of about 44½ per cent between 1919 and 1929 and 25½ per cent between 1924 and 1929. A large part of the decline since has occurred in the eastern half of the State, where moisture conditions are most favorable to rapid development of the bacterial wilt. Except under irrigation, conditions in the western and drier part of the State are unfavorable to the spread of the disease, and since 1924 there has been an actual increase in acreage in about half the counties, and a slight decrease in the others, though the total change has not been significant. A somewhat parallel situation is found in Nebraska, where the acreage declined from a maximum of 1,364,946 in 1924 to 1,139,085 in 1929, a reduction of about 16½ per cent. Here again the greatest decline was in the eastern part of the State and in the irrigated and subirrigated districts farther west. The census figures for these years also show a decline of about 19 per cent in acreage of alfalfa in Oklahoma and in the southwestern Iowa counties bordering the Missouri River. It should not be assumed that bacterial wilt alone is responsible for the reduced acreage in these States, but there is little doubt that it has been an important factor.

Symptoms of Bacterial Wilt

The most characteristic symptoms of the bacterial wilt are dwarfing and yellowing of the plant and drying out of the foliage, and occasionally wilting. Dwarfing is usually more conspicuous when the plants have reached one-half to two-thirds growth after cutting. The dwarfed plants are usually pale in color and the leaves are smaller than those of healthy plants. This condition is sometimes accompanied by a

bleaching and drying of the foliage. When the disease has developed sufficiently to be discernible in the foliage, the taproot nearly always shows discoloration, which is readily observable as a yellow or pale brown ring just beneath the bark when the root is cut across with a sharp knife. The ring, narrow at first, increases in width as the disease progresses. When the bark is stripped back the root is straw yellow to brownish yellow in contrast to the ivory white of healthy plants.

As the bacteria causing the wilt disease enter the plant through wounds, winter injury and bacterial wilt are closely associated, and it is not improbable that many of the losses attributed in the past to winter-killing, were due to bacterial wilt or a combination of the two factors. A thinning out of the plants may occur during the later part of the second crop year if the disease is especially destructive, and by the end of the third season the stand will no longer be profitable.

Controlling Bacterial Wilt

The nature of the disease offered little encouragement to satisfactory control by cultural practices, and the only hope of control seemed to rest on the possibility of discovering or developing an alfalfa that was resistant to the disease. The results of a variety test made at Manhattan, Kans., in 1922, indicated that control by this means might be possible. While this test was not started with any idea of determining resistance to wilt, since the disease was not known at that time, it produced some valuable information on that subject. Good stands were maintained until 1926, when a thinning out, due to the wilt, was noted. At the time the experiment was discontinued the plots of Ladak, Turkestan, and Kaw alfalfa still had satisfactory stands, while the other plots had been almost completely destroyed by wilt. Furthermore, in a survey of the wilt situation in Nebraska, fields 20 to 30 years old were occasionally found where the disease seriously reduced the stands of the domestic alfalfas generally grown in three or four years. Wherever it was possible to trace the original source of seed of such fields it was found to have come from Turkestan.

At the request of farmers in the territory where the disease was most destructive, a special appropriation was granted to pay for a search in Europe and Asia, especially Turkestan, for alfalfas resistant to the disease. Several hundred small lots of seed were obtained in 1929, mostly from Turkestan, and many more lots were obtained in 1930, from Spain and northern Africa. These lots have been tested for resistance to bacterial wilt, and while those from Turkestan differ somewhat, nearly all from that source have shown considerable resistance. All seed from other sources that has been tested has proved quite uniformly susceptible to the disease.

Two Methods of Determining Resistance

Two general methods have been employed in determining resistance to bacterial wilt. If sufficient seed was available it has been sown in plots of various sizes on land known to be infested with the wilt organism, and the progress of the disease has been observed from year to year. The objection to this method is that at least three or four years are usually required to determine whether a strain of alfalfa possesses sufficient resistance to merit further consideration. A more satisfactory method consists in sowing the seed in the greenhouse during the

winter. The following spring the seedlings are inoculated with the wilt organism and transplanted in rows in a field, preferably where they can be well watered during dry periods. In the fall the plants are dug up and examined. By this time, under favorable conditions, the disease will have developed sufficiently to make possible a determination of the comparative resistance or susceptibility. This method permits a larger number of determinations with a smaller quantity of seed than would be practicable under field conditions. Such tests are now being conducted in cooperation with the State agricultural experiment stations of Kansas, Nebraska, Wisconsin, and California.

Development of Resistant or Immune Strains

A comprehensive breeding program has been undertaken by the Department of Agriculture in cooperation with several State stations in an effort to develop strains of alfalfa that are highly resistant if not immune to bacterial wilt. Plants that have withstood infection when inoculated one or more times are used as foundation stock. Such plants are not homozygous (that is, do not have stable hereditary characters), and when they are "selfed" (bred among themselves) the progeny breaks up into susceptible and resistant individuals. Furthermore, selfing generally results in reduced vigor, though occasionally a line in which this does not occur to a marked degree is found. By utilizing such lines or by crossing two lines that have shown a high degree of resistance to wilt, it is hoped to produce a vigorous strain that retains its resistance to the disease.

There are other factors, however, that complicate the problem. Turkestan alfalfas, which are generally quite resistant to the wilt, are, as a rule, susceptible to certain leaf-spot diseases that are especially bad under humid conditions. Furthermore, alfalfas from Turkestan tend to become dormant early in the season, an undesirable characteristic in the South. It also appears that more than one strain will be needed to meet the requirements for cold resistance in the North and for rapid growth and high production in the South. Whether such a strain can be developed remains to be determined, but at best the program will involve several years. In the meantime, where wilt is a serious problem the farmer will need to utilize alfalfas that have shown considerable wilt resistance, such as Ladak, Hardistan, Kaw, and commercial Turkestan, where they are at all satisfactory and where seed is available, or else be content with growing the crop in short rotations.

Some Resistant Varieties

Attempts are now being made to increase the seed of Ladak, Hardistan, and Kaw.

For some time commercial Turkestan alfalfa has been recognized as being generally cold-resistant and has given fairly satisfactory results in the northern Great Plains, though yields have generally been somewhat less than those of domestic alfalfas. Owing to its wilt resistance, however, this variety can be grown to advantage where the disease is prevalent. It has not given good results in the South or in the humid East, because of its susceptibility to leaf-spot diseases and its tendency to become dormant early in the fall, resulting in low yields. Comparatively little seed has been received from Turkestan in recent years, though importations from that source would be desirable for certain sections of the United States.

Ladak, a variegated alfalfa, was introduced from northern India and was first recognized as a desirable variety for the northern Great Plains because of its resistance to cold and drought, but in later tests it has also shown considerable resistance to bacterial wilt. It has the further advantage of being less susceptible to certain leaf-spot diseases than Turkestan alfalfa, but so far has not appeared promising in the South and East, owing in part to its tendency to become dormant early in the season. A limited quantity of seed has been commercially available during the last few years, though not sufficient to meet the demand.

Hardistan is the name applied by the Nebraska station to what is apparently a strain of Turkestan alfalfa that first attracted attention by its apparent resistance to bacterial wilt and to cold. Preliminary tests indicate that it is not likely to prove very popular in the East or South, since it behaves much like commercial Turkestan in these regions. Hardistan has value in the wilt-infected areas of the Great Plains.

Kaw alfalfa was imported from France as Provence alfalfa under S. P. I. No. 34886 and for several years was carried in tests as such. It first attracted attention as being resistant to wilt in experimental plots at Manhattan, Kans., and Lincoln, Nebr. Later tests bore out the earlier results as regards disease resistance and because the variety behaved so differently from other lots of Provence alfalfa and so much like Turkestan, suspicion as to the exact source of the seed was aroused. A small quantity of the original seed was finally located, and the presence of characteristic Turkestan weed seeds identified the origin rather definitely as Turkestan. Efforts are being made to increase the seed for the benefit of sections where wilt is prevalent and where Turkestan alfalfa succeeds. It is doubtful whether it will prove any better adapted to the South and the humid East than is commercial Turkestan alfalfa.

Resistant Alfalfas Not Recommended Where Wilt Is Not Destructive

In most of the States where bacterial wilt occurs it is not uniformly destructive under all conditions, and where the losses are inconsequential some of the domestic alfalfas can be grown to better advantage than the resistant strains. Furthermore, the supply of such domestic seed is usually abundant.

In the drier parts of the Great Plains, from southern Nebraska northward, and in parts of the Northwest where bacterial wilt is not a factor but where cold resistance is essential to success, one of the variegated alfalfas—Grimm, Cossack, Baltic, Hardigan, Ontario Variegated, Ladak—or the northern common strains have generally proved more productive than Turkestan alfalfa. In the northern part of the Corn Belt and northward to the Canadian line these varieties are preferable to Turkestan if wilt does not cause serious losses.

In the Northeastern States, where alfalfa is generally grown in relatively short rotations, wilt has not yet caused much concern. Since the wilt-resistant alfalfas have not given satisfactory results in this region, growers should continue to use one of the cold-resistant variegated strains mentioned, or northern common strains, though the Utah and Kansas common are often satisfactory in short rotations.

Bacterial wilt is not yet prevalent in the South; and as the alfalfas that have shown resistance to the disease are generally unsatisfactory there, and as cold resistance is not a requirement, the less hardy, more rapid-growing alfalfas are preferable, since they are usually more pro-

ductive under such conditions. In the Southeast common alfalfa from Kansas and adjoining States has generally proved as satisfactory as that from any other source. Along the Gulf coast and in the Southwest more southern strains of common alfalfa and the hairy Peruvian variety may be used to advantage.

Yellowing of Alfalfa

For some time the cause of the so-called yellowing of alfalfa, which is undoubtedly responsible for material reduction in yields, particularly in the Eastern States, was unknown. Recent investigations indicate that this condition is largely the result of attacks by the leaf hopper *Empoasca fabae*, and as it has been possible to duplicate symptoms by mechanical means, the effect of the leaf-hopper attack seems to be physiological. It should not be assumed, however, that the leaf hopper is responsible for all the yellowing in alfalfa fields, because lack of inoculation, lack of lime, and dry weather are at times contributing factors.

H. L. Westover, *Bureau of Plant Industry.*

Hundreds of Different Kinds of Insects Attack Feed and Forage Crops

Hundreds of different kinds of insects, including some most destructive pests, attack feed grains and forage crops all along, from the time the seed is sown until the produce is finally consumed. More than 350 species are known to attack corn, and over 160 of these are particularly injurious. Insect pests of the other crops of this group include grasshoppers and cutworms, leaf hoppers and army worms, various kinds of aphids and grubs, beetles, bugs, and borers, to the number of several hundred additional species. Many of these are believed to have been here always, and to have transferred their attention from native grasses and other forage plants to the cultivated kinds of these crops—in many cases more palatable to the insects than the native varieties. The many pests accidentally introduced from foreign countries have been added to these native species. The European corn borer, the Japanese beetle, the alfalfa weevil, and several species of clover weevils, are in this group.

Some of the insects that attack feed grains and forage crops do all their damage below ground, while others feed on the leaves, blossoms, and stems of the plants or suck the juices from them. Still others, during their immature stages, bore up and down inside the stems. Some kinds take three or four years to produce one generation, while others produce 15 or 20 generations in a single season.

The corn ear worm might well be designated the most important of this group of insects. It is known by a number of aliases—the bollworm of cotton; the budworm of corn, tobacco, and other crops; the fruit worm of the tomato; and the head worm of the grain sorghums. It also attacks alfalfa, vetch, Crotalaria, beans, and other legumes, and even enters greenhouses and ruins the blossoms of carnations, chrysanthemums, and other flowers. No matter what is done to control it in one season, it migrates from the South again the next year and may be just as bad as ever.

The various habits of insects and the difficulties of their control are multiplied several hundred times because of the many kinds of pests concerned. Because of the wonderful adaptability of most insects, the

control of one or two or a half-dozen species that the average person may recognize is often a sizable undertaking. Devising remedies for several hundreds of other and less familiar species with wide diversity of habits is far more complicated, when any one or several of these species may suddenly appear in destructive hordes.

Knowledge of Insects' Ways Indispensable

It is hopeless to try to control insect pests without first obtaining a working knowledge of their habits and ways of living. Where do they come from? Do they gnaw the plant or suck out the juices? Do they have the regular four stages in their life histories—the egg, the larval or worm stage, the pupa or chrysalis, and the adult—or, like the grasshoppers, do the eggs hatch directly into baby insects very much like, except in size, their full-grown parents? What are all these stages like? Are the adults moths, butterflies, bugs, or beetles? What crops will each of the several hundred species eat? Are they specific or general feeders? How many generations are produced in a season, or how many weeks, months, or years does it take to produce a single generation? How and where do they spend each stage of their development? In which stage do they pass the winter? These are a few of the more elementary questions that the entomologist must answer before an intelligent attempt can be made to develop control measures. The best cultural practices in crop production must also be carefully considered, for after all the farmer is interested in insect control primarily as it may affect the maximum yield of high-quality produce. Because of the extensive acreage of feed grains and forage crops and their relatively low per acre value, the so-called "squirt gun" methods of insect control are too expensive. It is necessary, therefore, to resort to strategy. With the requisite entomological and agronomic information available, it is frequently possible to outwit an insect pest by appropriately adjusting cultural practices, such as time of planting, time of harvesting, method and thoroughness of cultivation, rotation of crops, seed selection, and fertilization.

Clean culture is one of the most effective methods of fighting many of the insect pests of feed grains and forage crops, especially if it includes the general farm clean-up which has so many obvious advantages other than the control of insects. Being so easily practiced, it is surprising that clean culture has not been more generally adopted. The European corn borer can be controlled by using or destroying all parts of the corn plant by feeding, burning, or plowing them under cleanly. Moreover, plowing under cornstalks and débris serves as a partial control of some plant diseases and is in addition a valuable method of improving the soil. By burning, late in the fall, the tall grass in which they have decided to hibernate, chinch bugs may be killed outright or exposed to fatal cold later in the winter. The cleaning up of fence rows and irrigation ditches in fields where alfalfa and clover are being grown for seed materially reduces the subsequent infestation of the alfalfa or clover seed chalcid.

There is no direct method of control known to be effective against webworms once they have seriously infested the first planting of corn. After this first planting has been pretty well destroyed, the farmer, left to his own resources, usually plows out the remaining corn and replants the field. Webworms then merely transfer their attention to the next planting and the disaster is repeated. It has been discovered,

however, that if, in replanting, the old rows are straddled and all the partly eaten corn plants are left undisturbed, a second planting will usually produce a good stand, as the webworms continue to feed and develop on the first planting, which later may be plowed out at the time of the first or second cultivation.

The results of investigations on the alfalfa weevil indicate that losses due to its depredations may be materially reduced by harvesting the first and second crops at such a time that the weevils, in the larval stage, are left exposed to the heat of the sun and the hot surface of the bare stubble fields.

Crop Rotation Troublesome to Insects

Generally speaking, crop rotation is one of the cultural practices most troublesome to insects. The corn rootworm is completely controlled by the most simple form of crop rotation, because it is only destructive when corn follows corn in the rotation. It no longer need be a pest at all except in bottom lands that overflow each year, usually remaining wet until late spring. Crop rotation is not so easily arranged here and, because a thick layer of silt is deposited each year, planting corn after corn is a very profitable cropping system and, except when rootworms are present, fits well into the natural limitation of such areas. Crop rotation is also very discouraging to other insect pests because it forces them to move from field to field, thus exposing themselves to unfavorable weather conditions and natural enemies. Such control methods, however, can not be considered foolproof. A change from a grass crop to corn, with the corn planted immediately after the sod has been plowed, at once puts the cutworms, white grubs, and webworms in the sod on short rations, with the result that several plantings of corn may be eaten up as fast as the plants appear. In such a case, early fall plowing, adequate cultivation, and late planting of corn produce a starvation period fatal to the little worms and grubs.

Almost any practical measure taken to increase the production of sturdy and robust plants minimizes or reduces the losses caused by insect attack. Seed selection and fertilization are very important factors of this kind. Moreover, using good, pure seed, of varieties locally adapted, usually results in uniformity of stand, growth, and time of reaching maturity—all important in the control of insects by cultural practices. For example, if ordinary clean culture is practiced and by seed selection all the fields of seed sorghums in a community are made to ripen at about the same time, the sorghum midge does not have an opportunity to breed in injurious numbers until after most of the crop has been harvested.

The control of insect pests of feed grains and forage crops is, therefore, largely a matter of preventing infestation, and not one of cure after the crop has been attacked and partly destroyed. Fortunately, many cultural practices that may be used or adjusted to control insects are in themselves good farm practices, regardless of insect control. Community cooperation is particularly necessary in the control of practically all the insects of this group. Communities in which the farms are well-managed, with clean, well-cultivated fertile fields, clean fence rows, and crops intelligently rotated and grown from good, pure varieties of seed, usually have the least trouble with their insect problems.

W. H. Larrimer, *Bureau of Entomology.*

LIVESTOCK

PRICES, Numbers, and Kinds of Animals Vastly Changed Since the War

Marked changes in the livestock situation in the United States have taken place since 1920. During these years the livestock industry has had to readjust itself not only to the abnormal conditions within the industry caused by the World War but also to the very unusual developments in the general agricultural situation at home and abroad that have resulted from changes in economic and financial relationships and from changes in agricultural technic.

During the 20 years preceding the war the trend in numbers of all species, except sheep, was upward (fig. 28), with a growing tendency

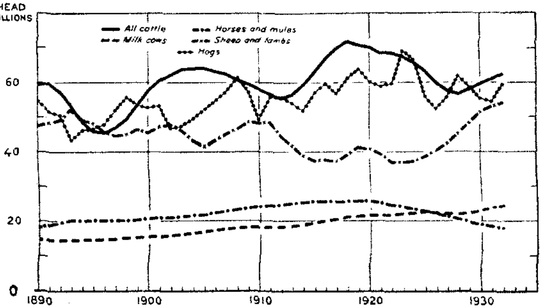


FIGURE 28.—Livestock on farms, January 1, 1890 to January 1, 1932. During the three decades, 1890 to 1920, the trends of numbers of all species of livestock except sheep were upward. That of sheep was downward, especially in the third decade, 1910 to 1920. During most of the years since 1920, the trend in numbers has been upward for sheep and downward for all cattle and for horses and mules. Hog numbers during this period fluctuated widely from year to year but showed no decided upward or downward trend. Milk cows which are included in the all cattle numbers have tended upward over the whole period, 1890 to 1933. Each species has a different cyclical movement around its trend

for the heavy grain-consuming animals (hogs, milk cows, and work stock) to make up an increasing proportion of the total. Livestock production, measured in terms both of grain-consuming and of pasture, hay, and forage consuming units, increased steadily during this period. (Fig. 29.) This trend in total livestock and in the shift to the heavy grain consumers reflected the changes taking place in the relation of feed-grain production to hay, forage, and pasture production.

During this period the area in farms was increasing as unoccupied or grazing lands in the West were converted into farms, and virgin sod was plowed up; at the same time there was a tendency in the older farming regions of the Middle West to increase feed-crop acreage at the expense of pasture. These shifts made more total feed available for livestock—the basis of the increased livestock production—with relatively more feed grain and feedstuffs and less pasturage.

Livestock production was markedly stimulated during the war, as a result of both the rapidly advancing prices and the war-time propaganda to increase food production. Feed-grain production, because of the emphasis on increased food production, did not make a corresponding increase, although feed-grain prices increased more than did livestock prices. By 1919, the number of animal units had reached the highest point ever attained up to that time. This number was exces-

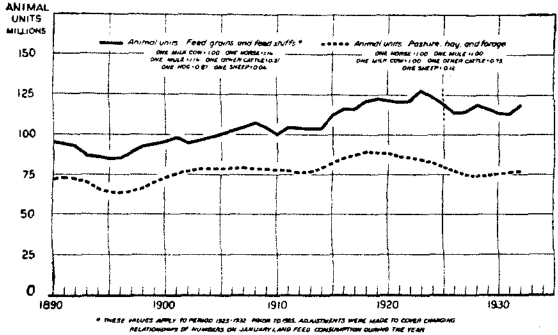


FIGURE 29.—Animal unit equivalents of total livestock on farms, January 1, 1890, to January 1, 1932. Since there is so much difference in the size and feed requirements of different species of livestock, the trend of total livestock can only be shown by converting each species to an animal-unit equivalent and getting the sum of these units. The trend of animal units based on the consumption of feed grains and feedstuffs was steadily upward until about 1923, and since 1925 has shown little trend. The number of animal units based on the consumption of pasture, hay, and forage has shown little trend since 1900 and the up and down movements have been of relatively long duration, reflecting the long cattle and horse and mule cycles

sive, not only from the standpoint of its relationship to feed supplies in years of below-average feed production, but also from the standpoint of potential per capita meat production when compared with such production in the pre-war years. But because of the heavy exports of meat during the war and immediately afterwards, the per capita domestic consumption had been below the pre-war average and the food policies adopted during the war tended to discourage the use of meat for food.

Another effect of the war was to speed up both the movement toward the mechanization of agriculture and the substitution of motor power for animal power in nonagricultural uses. As a consequence, the need for horses for farm work was reduced and the number of horses and mules used elsewhere declined. In addition, a distinct stimulus toward substituting mechanical for animal power on farms had come from the increased use of automobiles by farmers and farmers' consequent familiarity with the mechanics of gasoline engines.

In 1920, the situation confronting livestock producers may be briefly described as follows: Numbers of all species, except sheep, were near the peak and the potential output of meat was excessive for domestic consumption; the war-time export outlet for chilled or frozen beef was cut off and the export outlet for cured pork products and lard promised to be curtailed; the demand for horses and mules for war purposes ceased and the uses for these, both in agricultural and nonagricultural work, was declining; marked readjustments in numbers to post-war conditions were necessary.

Influence of Feed-Grain Situation

These readjustments, however, were materially affected by trends in feed-grain production and prices. A considerable part of the former feed-grain acreage that had gone into food crops during the war shifted back to feed grains after 1920. Three favorable years for corn production, 1920 to 1922, resulted in a heavy accumulation of corn on farms and low prices for this grain, both absolute and relative to livestock prices. The fall in cattle prices during the 1920–21 depression tended to check the liquidation of cattle numbers started in 1919. The downward movement in total livestock, which extended from 1919 to 1922, was halted as hog numbers responded to the low price of corn and the favorable hog-corn price relation. A sharp upturn in hog production in 1922 carried the total of all livestock to a new record peak and then for three years came a precipitous drop, as numbers of hogs, cattle, and horses all declined.

The new level in numbers reached in 1926 was not greatly different from that of 10 years earlier but was much above the 1910–1914 average. Livestock units based on feed-grain and feedstuff consumption have been used in making these comparisons. The picture of changes in animal units based on pasture, hay, and forage consumption is somewhat different. (Fig. 29.) From the peak of animal units reached about 1918, when both cattle and work-stock numbers were near their highest points, the decrease was steady until 1928. Since that time the increase has been only gradual, as steadily declining work-stock numbers have tended to offset the increasing numbers of cattle and sheep.

The situation at the beginning of 1930 was materially different from that at the beginning of the previous decade. Livestock numbers, in terms of grain-consuming units, were near the lowest point in 15 years, and in terms of hay and pasture consuming units were near the lowest point in 30 years. No problem of readjustment from an excessive supply of all livestock was facing the industry, although such a readjustment in the case of sheep seemed imminent. With respect to meat animals alone, the situation was somewhat different in that they had become a relatively larger proportion of the total as a result of the continuous decline in work stock which made increasingly large amounts of feed available for meat animals. Likewise, poultry and egg production were at much higher levels than they had been 10 years earlier. The hog situation was also markedly changed, in that the output of hogs, based on numbers at the beginning of each year, had increased greatly because of the marked shift in production to areas where output in relation to January 1 numbers is large. On the whole, however, potential meat production was well adjusted to consuming demand at a relatively high level of prices.

Delayed Impact of the Depression

The depression beginning in 1929, and the resulting sharp drop in prices of all agricultural products, had not tended greatly to disrupt the favorable production situation of livestock until the end of 1932. To a considerable extent this was due to the droughts of 1930 and 1931, and the resulting short crops of all kinds of livestock feeds which worked against increased livestock production and which, by keeping feed prices relatively high, reduced the financial stimulus to such increase. Because of the extremely low prices of cull meat animals, such as old ewes and thin cows, the marketings of such stock were greatly curtailed. This curtailment tended to continue the increase in sheep numbers when normally a reduction would have been expected, and to accelerate the increase in cattle numbers, both dairy and beef.

The unusually large production of feed and feed grains in 1932 and the very low prices for these put a different aspect on the livestock situation at the beginning of 1933. The production of livestock and livestock products, in spite of low prices, still offers a better market for feed grains than does the cash market, and the only outlet for roughage. The necessity of raising funds and the impossibility that the cash-grain market will absorb any considerable part of the increased grain production at a price that will bring returns at all commensurate with the needs, are likely to stimulate a marked increase in livestock production during 1933 and 1934. This increase will be largely in hogs and in grain-finished cattle. Moreover, the extremely low market price for old cows probably will result in an increase in calf production. As in other similar periods with low prices for both cash crops and feed crops, the tendency will be for most adjustments to work toward increased livestock production. As business conditions return toward normal, much of the improvement in prices resulting from the advance in the general price level is likely to be lost by livestock producers, because increased supplies will tend to offset improved demand.

Cattle

Cattle production in the United States from 1880 to 1928 moved through three complete cycles of increasing and decreasing numbers with rather significant regularity. The years of the low points in total numbers which marked the beginning and end of each of these three periods were 1880, 1896, 1912, and 1928. The year of the last high point was 1918 when numbers of all cattle reached the record peak of about 71,000,000. From this peak, numbers declined steadily to 56,700,000 at the beginning of 1928. This latter number was about 1,700,000 higher than that of the previous low point reached in 1912.

The trend in numbers of cows and heifers kept for milk has for the last 40 years been steadily upward, with only slight indication of cyclical variations, such as are shown by other species of meat animals and by all cattle. (Fig. 28.) The function of the dairy industry being to furnish indispensable food products, it is to be expected that the number of milk cows in a country of steadily increasing population will increase somewhat as population increases. Since numbers of all cattle have shown much more pronounced cyclical variations than the numbers of milk cows, the ratio of milk cows to all cattle has been constantly changing, with the trend over the period decidedly upward as the number of milk cows increased.

From 1928 to 1932, numbers of all cattle increased about 5,700,000, or 10 per cent. In the corresponding four years, 1912 to 1916, of the previous cycle the increase amounted to 21 per cent. Most of the increase from 1928 to 1932 was in the West North Central States (western Corn Belt) and much of it was in cattle for dairy production. In these four years, the increase in all cattle numbers in this area was equivalent to about 90 per cent, and that of beef cattle to 50 per cent, of the respective reductions that occurred between 1920 and 1928. The East North Central States (eastern Corn Belt) rank second in the relative increase in numbers during the same four years. Expansion in the western range States during this period, however, was very small, largely because of the competition for the available range from the large numbers of sheep in those States. There also was but little increase in cattle numbers in the cotton States. The distribution of all cattle numbers by regions at the beginning of 1932 was: North Atlantic States, 7.5 per cent; East North Central States, 16 per cent; West North Central States, 32 per cent; South Atlantic States, 5.9 per cent; South Central States, 21.9 per cent; and Western States, 16.7 per cent.

The striking feature of the increase in cattle numbers since 1928 is that it has been confined largely to cows and calves—the number of steers has shown little increase. This increase in cows has resulted in increasing calf numbers but with no compensating increase in calf slaughter, and as a consequence the number of calves on January 1 has increased each year from 1929 to 1932. Of these increased numbers of calves on January 1, the steers have been largely slaughtered within the following 18 months as yearlings or 2-year-olds, and there has been no accumulation of aged steers, such as has occurred in other periods of increasing cattle numbers. Although there has been an increasing number of heifer calves of beef type slaughtered as yearlings, the greater part of the increased numbers of January 1 each year has gone ultimately to increase the numbers of milk and beef cows.

The type of expansion that has taken place in cattle numbers may be accounted for by the conditions that have existed in the cattle industry since 1927. The relatively high prices of all cattle from late 1927 to the end of 1929 caused producers to hold back breeding stock as the first step toward increasing production. The drastic price decline in 1930 which was especially marked in all grades of slaughter cows, tended to reduce cow marketings below what they normally would have been, and the continuing low level of these prices through 1931 and 1932 has further restricted marketings of such cattle. The relatively favorable financial position of cattle producers following the period of high prices in 1928 and 1929 has made it possible for them to pursue this holding policy in the hope that the general price situation would improve. In addition, with agricultural income from all sources at a low level, many farmers have felt that by retaining their cows and raising calves, and by milking more of these cows, they would realize more than by sacrificing them at such low prices.

During most of the years of declining cattle numbers from 1918 to 1928, total slaughter of cattle and calves was relatively large, reaching a record peak in 1926. (Fig. 30.) It has since been declining steadily and in 1932 was the smallest since 1921. As a result of this decline in total slaughter, the per capita supply of beef for consumption in

1932 was the smallest for any year for which records are available. Slaughter of cows and heifers reached a peak in the 12 months ended June 30, 1926, and has since declined sharply, falling in 1932 to the lowest levels in many years. Steer slaughter, which also reached a peak in 1926, dropped off sharply until the beginning of 1929 and then turned upward. Slaughter of steers in 1931 was almost as large as that of 1927 but there was a slight decrease in 1932. As a result of the marked reduction in slaughter of cows and heifers since early 1926, the number of cows on farms on January 1, 1933, was the largest total ever reached in this country and the 1933 calf crop may be the largest.

From 1921 to 1926 cattle prices were low as compared with prices of other agricultural products, but with the reduction in slaughter in 1927 they moved sharply upward. (Fig. 31.) During 1928 and 1929, prices were at high levels, reflecting the further decreases in slaughter

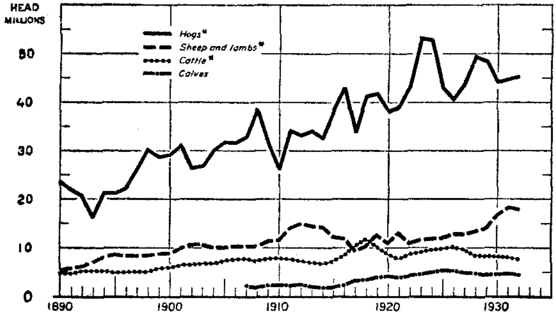


FIGURE 30.—Livestock slaughtered under Federal inspection, estimated equivalent and as reported, 1890–1932. The general trend of commercial livestock slaughter has been upward during the last 40 years. The yearly fluctuations in hog slaughter are much greater than those of cattle and sheep. There also is rather close similarity between the cycles of hog production and cycles of hog slaughter, but neither cattle nor sheep and lamb slaughter reflect closely the cycles in numbers of those species

and an unusually strong consumer demand for beef. Demand weakened after 1929 as a result of the sharp drop in consumer income, and although cattle slaughter continued to decrease, the trend of cattle prices has been downward since that year and near the end of 1932 the general average was at the lowest level since 1908.

In the past, the periods of increasing numbers in the cattle production cycles have been from six to eight years in length. Neither the duration of the current period of increasing production nor the extent to which numbers will be increased can be definitely forecast because of the abnormal nature of the increase to date and the uncertainty of future economic conditions and their effects on the cattle industry. The increase in breeding stock since 1928 has placed the industry in a position to increase its yearly output of beef very materially and a considerable increase in cattle slaughter during the next few years is to be expected.

Hogs

Hog production in the United States has moved through two complete cycles since 1920. (Fig. 30.) Production (as indicated by the yearly pig crops) increased during 1921 and 1922 to the highest level on record, and then declined sharply from 1923 to 1925. The second cycle got under way in 1926, reached its peak in 1927, and ended in 1930. The increase in both the spring and fall pig crops of 1931 indicated that another cycle was beginning, but the expansion in production was checked during the spring of 1932 as a result of the short corn crop in the western Corn Belt during 1931 and by very unfavorable weather at farrowing time in the most important producing areas. The 1932 spring pig crop was 7 per cent smaller than the spring crop of 1921.

The number of hogs on farms in the United States on January 1, 1932, amounting to 59,078,000 (fig. 28), was about the same as the

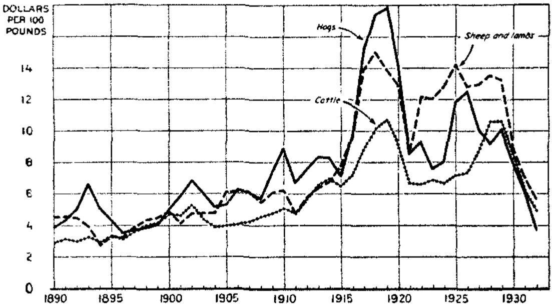


FIGURE 31.—Average prices paid for livestock by wholesale slaughterers, 1890–1932. Livestock prices rose gradually from the early nineties to the beginning of the World War and then advanced sharply during the war. Record levels were reached in 1918 for sheep and lambs, and in 1919 for cattle and hogs. Prices broke sharply from these levels to late 1921, but recovered much of this decline between that year and 1929. From 1929 to the end of 1932, the drastic reduction in consumer incomes, associated with the world-wide business depression, caused prices of all meat animals to decline to the lowest levels in many years. The movement of livestock prices throughout the 40-year period was very similar to the general movement of all commodity prices

number on farms January 1, 1920, but there was a marked shift in the geographical distribution of hog production during this period. Production expanded rapidly in the western Corn Belt States, which constitute the most important commercial hog-producing area, but numbers declined sharply in the South Central and the Eastern States, where only a small proportion of the supply goes into commercial slaughter. From January 1, 1920, to January 1, 1932, hog numbers increased 39 per cent in the western Corn Belt, whereas they decreased 39 per cent in the Atlantic States, 30 per cent in the South Central States and 15 per cent in the eastern Corn Belt States. Numbers in the far Western States on January 1, 1932, were 4 per cent larger than on January 1, 1920. In 1932, the western Corn Belt States had more than half the total number of hogs in the entire country whereas in 1920 they had only 37 per cent of the total. As a result of this greater concentration in the most important commercial-producing area, the

commercial slaughter supply in 1932 was 19 per cent larger than in 1920, although numbers on farms were about the same at the beginning of both years. The 12 Corn Belt States now raise about 80 per cent of all the hogs produced in this country and furnish about 90 per cent of the hogs that go into commercial slaughter.

The concentration of hog production in the western Corn Belt where the average number of hogs raised per farm is much larger than in other sections of the country, has placed the industry on a more efficient basis. An abundance of corn and other feed is produced in that area at relatively low cost and the climate is favorable for hog production. The trend toward commercialization has been accompanied by many improvements in production methods, including greater use of protein supplements in hog rations, more intensive feeding, and better control of hog diseases. As a result of these developments, the average live weight of hogs slaughtered has trended upward during the post-war period although the average age at which hogs are marketed has not changed materially. The average number of pigs saved per litter also has increased considerably during recent years.

United States exports of hog products have been trending downward since 1919, and during the marketing year 1931–32 the total was the smallest yearly total in 50 years. The sharp reduction in exports has been due largely to the marked upward trend in European hog production. The expansion of the hog industry in Germany and Denmark, the most important producing countries in Europe, has placed the hog population in those countries above the peak levels reached just prior to the World War. Production in most other foreign hog-producing countries also has increased during recent years. Depreciated currencies abroad, together with increased tariff duties in several importing countries, were additional unfavorable factors affecting United States exports of hog products during 1932.

As a result of the expansion in production during 1931, slaughter supplies of hogs during the marketing year ended September 30, 1932, amounting to 46,655,000 head, were 7 per cent larger than those of the preceding marketing year and 2 per cent larger than the 5-year average There also was an increase in the proportion of the total hog supply going into farm and other nonfederally inspected slaughter. Hog prices during the 1931–32 marketing year were the lowest in more than 35 years. (Fig. 31.) The average price paid by packers for hogs slaughtered under Federal inspection was $4.05 per 100 pounds as compared with $7.21 in 1930–31 and $9.58 in 1929–30. Although slaughter supplies of hogs were somewhat larger during the 1931–32 marketing year, most of the decline in prices from early 1930 to the end of 1932 was due to the sharp reduction in consumer income.

Despite the low level of hog prices during 1932, corn prices were even lower. The relationship of hog prices to corn prices during most of the year, therefore, was such as to encourage hog production. According to estimates of this department, the 1932 fall pig crop was 4 per cent larger than the fall crop of a year earlier, and the number of sows to farrow in the spring of 1933 is about 2 per cent larger than the number that farrowed in the spring of 1932. Hog-production cycles in most foreign countries turned definitely downward during 1932 and hog slaughter in those countries during 1933 and 1934 is expected to be smaller than that of 1932. The reduction in foreign production, however, will not result in an increase in United States exports of hog prod-

ucts to the extent that similar reductions have in the past if the higher tariff duties and other trade barriers adopted recently in several importing countries remain in force.

Sheep, Lambs, and Wool

The sheep industry, in addition to being adversely affected by the world-wide business depression and the general decline in all commodity prices, is confronted with difficulties arising from greatly expanded sheep and wool production. All the important sheep and wool producing countries of the world have participated in this expansion. In the United States, sheep numbers increased from 36,695,000 at the beginning of 1923, the post-war low, to the record figure of 53,321,000 on January 1, 1932. (Fig. 28.) Slightly more than 72 per cent of the increase in this period took place in the 13 Western States, including Texas and South Dakota, and about 25 per cent occurred in the Corn Belt States, excluding South Dakota.

The 1931 lamb crop, totaling more than 32,000,000 head, also established a new record. The 1932 lamb crop, however, was 8 per cent smaller than that of 1931 and about 1 per cent smaller than that of 1930. All of the decrease occurred in the Western States, and was due to the severe winter and the shortage of feed which caused exceptionally heavy losses of ewes in these States in early 1932 and resulted in a small percentage of lambs saved.

The large expansion in sheep production has been reflected in greatly increased slaughter supplies. (Fig. 30.) Total federally inspected slaughter of sheep and lambs (consisting mostly of lambs) during the lamb crop marketing year ended April 30, 1932, amounting to 18,714,000 head, was the largest on record and exceeded that of the marketing year 1922–23, the post-war low, by 64 per cent. All of this increase in slaughter was absorbed in the domestic market. United States exports of mutton and lamb are negligible. Lamb consumption in this country is not only distinctly urban but is concentrated in rather limited areas. For this reason the demand for lamb tends to reflect changes in consumer purchasing power resulting from changes in industrial activity. From 1922 to 1929, inclusive, the demand for lamb increased, as was indicated by an increasing supply being taken at a higher price. In 1922, sheepmen furnished the American consumer 5 pounds of lamb and mutton per capita. In 1929, the amount was increased to 5.8 pounds and it was taken by consumers at a higher unit price than that of 1922. The per capita supply was increased to 7.1 pounds in 1931. This was 42 per cent more than in 1922 and 22 per cent more than in 1929. Consumer demand, however, was greatly curtailed as a result of lowered purchasing power and the increased quantity was moved into consumption only by reducing prices materially.

Lamb prices were on a relatively high level from the beginning of 1922 to early 1930. (Fig. 31.) A downward trend began in the spring of 1929 and prices declined sharply throughout 1930. Some recovery occurred in early 1931 but a further decline carried prices in 1932 to the lowest levels on record. The average price of sheep and lambs slaughtered in the marketing year ended April 30, 1932, was $6.38 per 100 pounds. This is $7.57, or 54 per cent, less than the average price for the year ended April 30, 1929.

With the expansion in sheep numbers, United States wool production also increased and the record 1931 clip closely approached the average

domestic consumption of combing and clothing wools. Wool production in other important producing countries also expanded and the total world clips in both 1931 and 1932 were at record levels. Because of unfavorable weather and feed conditions and heavy death losses among flocks in the previous winter, the production of shorn wool in the United States in 1932 was about 7 per cent smaller than that of the previous year.

Demand for wool in 1931 and 1932 was greatly reduced as a result of the depression, and both consumption and imports fell off sharply. This reduced demand together with the increased production caused wool prices to decline to very low levels. Demand strengthened, however, in the summer of 1932 and active buying resulted in an encouraging price recovery, although prices at the end of the year were still very low.

Although sheep production tends to move in cycles, these cycles are somewhat irregular, both in length and in relative spread between low point and high point. Major depressions in sheep and wool prices have generally been followed by important shifts in the geographical distribution of sheep numbers and by marked changes in the character of the industry. In periods of low prices, the necessity of reducing operating costs and meeting the competition from other agricultural enterprises has caused sheepmen to shift their production to cheaper lands, and this has accounted for most of the geographical shifts in the industry that have taken place within the last 100 years. During such periods wool prices usually decline to relatively lower levels than lamb prices and this was the factor which initiated the earlier shifts from an enterprise in which wool was the major source of income to one in which mutton and, later, lamb production, was of greater importance.

Following previous periods of overexpansion in the industry a reduction in sheep numbers was brought about largely by heavy marketing of lambs and by failure to keep back sufficient young stock to replace the heavy losses of aged sheep resulting from lack of care, exposure, and old age.

The trend of sheep numbers and of wool production in this country during the next few years will be dominated largely by developments in the Western States. In these States sheep production is a major and in many cases an exclusive enterprise. The financial situation of the western sheep industry has become serious. During the next few years it will be necessary for western sheepmen to realize as large cash returns as possible from each year's operation in order to meet obligations. This will mean a close marketing of the lamb crops, and consequently a reduction in the total number of breeding ewes.

Horses and Mules

The cycle of production of horses and mules is much longer than that of any other species of livestock. (Fig. 28.) This is because numbers of work animals are not decreased over short periods of time by increased slaughter, as is the case with meat animals, but they tend to live out their natural lives, which average about 15 years for horses and about 20 years for mules. Since work animals, prior to 1910, were almost the exclusive source of power on farms and to a large extent of motive power in towns and cities and in construction work, the number of these animals on farms in the United States increased almost

without interruption from the Civil War until 1920, tending to follow the increase in human population and the expansion of farm acreage.

Between 1910 and 1920, however, the substitution of gasoline motor cars and trucks for work animals in nonagricultural uses progressed rapidly, with the result that horses and mules not on farms decreased from 3,450,000 in 1910 to 2,080,000 in 1920. Work animals on farms, however, continued to increase during this period, but at a much slower rate than in the previous decade. The increase in the total of horses and mules between 1900 and 1910 was about 3,500,000, whereas between 1910 and 1920 it was only 1,600,000. By 1915, the decreasing demand for work stock in nonagricultural work began to be reflected in lower prices, but the war-time demand then came into the situation and tended to hold up prices for several years, and thus delayed the decrease in colt raising that sharply lower prices would have caused. Between 1910 and 1920, the use of automobiles on farms increased rapidly and the widespread familiarity with the mechanics of gasoline motors thus gained was a material factor in stimulating the use of trucks and tractors. By 1920, these machines were coming into greater use but the period of their rapid expansion came after that year.

By 1920 the unfavorable situation for work stock became fairly evident. The demand for horses and mules for nonagricultural uses almost disappeared and there was no market for surplus work animals. Horse and mule prices dropped sharply in 1921, along with prices of other commodities, but continued to decline in following years after other prices improved. The raising of colts declined quickly. The number of horse and mule colts raised in 1919 was 1,599,000; in 1924, 758,000; in 1929, 576,000; and in 1932, 522,000. With the dropping off in the movement of older animals from farming to nonfarming uses, the decline in work stock of working age was relatively slower, the reduction coming largely from the growing excess of the number of deaths over that of young animals reaching maturity. Because of the very low prices for certain kinds of horses there developed a horse-slaughtering activity which in recent years has used about 125,000 horses yearly. Horses and mules 2 years old and over on farms in 1920 numbered 22,408,000, in 1925 they numbered 21,027,000, and in 1933 there were 16,100,000.

Between 1920 and 1930, the use of trucks and tractors on farms increased rapidly. The census reports show the following numbers: Trucks in 1920, 139,169; in 1930, 900,385; tractors in 1920, 246,083; in 1925, 505,933; in 1930, 920,021. This increase in use of trucks and tractors tended to cause the decrease in work-stock numbers.

By the beginning of 1933 the work-stock picture was much changed from that of 1920. Not only had numbers been reduced drastically but the average age had increased and colt raising was still below a replacement basis. Because of the high average age of all work stock and because of a depletion in the number of suitable breeding stock, the total number of horses and mules will continue to decline for some years even though increased breeding takes place as a result of an improved price relationship. The effect of the depression has been to increase the use of work stock on farms and to decrease the use of mechanical power as farmers were forced to reduce cash expenditures of all kinds. As a result, the price of work animals has declined less than that of any other important farm product. Work-stock prices

relative to prices of other species of livestock are much above the average of the previous 10 years. If such a relationship continues for any great length of time it can be expected to stimulate colt raising and thus shorten the time during which total horse and mule numbers will continue to decline.

C. L. Harlan, C. A. Burmeister, *and* G. B. Thorne,
Bureau of Agricultural Economics.

ANIMAL Disease Control by Scientific Methods Shows Notable Progress Attention to the health and vigor of livestock gives stability and safety to their production. In contrast with futile treatments and erroneous beliefs, scientific research and sound procedure have furnished means of mastering most livestock diseases. Whether market prices are favorable or otherwise, whether feed is abundant or scarce, and whether production is increased or curtailed, livestock health is always an asset to be zealously sought and maintained. It also has a bearing on human health, since numerous livestock maladies are transmissible to man.

Well-organized research is chiefly responsible for the progress made thus far in improving animal health. Campaigns against tuberculosis, tick fever, hog cholera, scabies, and other diseases have been noticeably fruitful. However, losses from common diseases and parasites still exceed $250,000,000 annually, or about $40 for the average farm.

Many Livestock Diseases Excluded by Quarantine

Fortunately the United States is entirely free from certain infections that are present among livestock in other countries. Hence, the procedure against such diseases is merely to maintain effective quarantines and to be prepared to eradicate quickly any infection that may pass the quarantine barriers. Among the most serious foreign dangers are foot-and-mouth disease, rinderpest, surra, contagious pleuropneumonia, epizootic lymphangitis, and European fowl pest. These scourges cause heavy losses in various parts of the world.

The United States Department of Agriculture and the sea-coast and border States bear the chief responsibility for protecting livestock in this country from those foreign dangers. Veterinary officials enforce regulations relating not only to imported livestock, but also to animal by-products, feeding materials, hides, skins, and numerous other commodities from foreign countries.

Procedures Against Infectious Diseases

Before systems of protection were provided, many communicable diseases had already gained access to the United States and had become prevalent. This condition occurred before the establishment of the Department of Agriculture. The present discussion deals with those diseases which offer particular opportunity for better control, with resulting savings.

Anthrax, or charbon, is an acute, infectious disease affecting cattle, horses, and mules principally. No domestic animals are exempt, and man is occasionally infected. The germs of anthrax are resistant to heat, cold, and disinfectants, and once they became established in the soil may become a serious menace to livestock. Hay or other crops

grown on infected areas may cause anthrax if eaten by susceptible animals.

The most effective method of dealing with anthrax is prevention, consisting of (1) quarantining infected premises, (2) vaccinating all exposed animals, and (3) burning to a crisp or deeply burying the carcasses of animals that have died of this disease and then disinfecting affected parts of the premises. The advisability of vaccination against anthrax depends on whether the disease has actually occurred on the premises in previous years, the closeness of the infection, weather conditions, and other local factors. In dealing with this plague, livestock owners should cooperate to the fullest extent with their local veterinarians and livestock sanitary officials.

Blackleg is a rapidly fatal, infectious disease that attacks principally cattle between 6 and 18 months old. Principal symptoms are high fever and the formation under the skin of gaseous swellings or tumors which give a crackling sound when pressed. They occur especially on the hind quarter or shoulder and commonly cause lameness or stiffness. Rapid breathing and great depression are other common symptoms. The disease nearly always terminates fatally within 36 hours. Medical treatment is ineffective, but animals may be protected against the disease by blackleg vaccines, of which several forms are on the market. Carcasses of animals which have died of the disease should be burned to a crisp or deeply buried.

Hemorrhagic septicemia, sometimes called shipping fever, affects principally cattle that undergo shipment or exposure in severe weather. Greatest losses occur in the fall and winter. The infection is commonly harbored in the systems of animals, hence there is slight hope of protecting them from infection. Main reliance should be placed on maintaining normal vigor so that they may resist the infection.

When cattle arrive at destination in cold weather, especially if it is stormy or wet, dry shelter and careful feeding and watering aid in restoring normal vigor. The use of bacterins and aggressin on animals while in transit does not reduce losses and may even increase them. The best results are to be expected when these products are used at least 10 days before animals are shipped. Antihemorrhagic-septicemia serum, on the other hand, possesses curative value in the early stages of the disease and is advised when cattle are to be treated on or shortly after arrival at destination, especially if any animals in the shipment show symptoms of the disease. Any biological product used should be administered by a competent veterinarian.

Hog cholera, the most serious disease of hogs, appeared in the United States about 100 years ago and has spread to every State. In recent years known outbreaks have numbered about 3,000 annually. There is no cure for this disease notwithstanding hundreds of alleged remedies. The disease is readily prevented, however, by immunizing susceptible hogs with anti-hog-cholera serum either alone or in combination with hog-cholera virus. When applied to small pigs the treatment is especially economical since the dosage of serum is much less for a small animal than for a large one. Where hog cholera is prevalent, swine should be kept immunized; also, it is advisable to protect valuable breeding stock and garbage-fed hogs by systematic immunization.

Infectious abortion, also called contagious abortion and Bang's disease, is the most dreaded and costly livestock malady in the United States. It causes estimated losses of approximately $50,000,000 annu-

ally. Many animals seemingly healthy may carry the infective germs in their udders or discharge them in large numbers at abortion or apparently normal parturition. An infected cow that has ceased to abort or that has never aborted may still be a dangerous carrier of the infection. Medicinal treatment, including the use of proprietary remedies, is ineffective against this disease.

The following measures are helpful in combating infectious abortion: (1) Keep susceptible animals, especially when pregnant, from coming in contact with the infection; (2) use maternity stalls so that any infection can be readily confined and destroyed; (3) after calves are 6 months of age (before that they rarely contract the disease) keep them away from infected animals and premises; (4) develop herds from their own progeny, but if breeding stock must be purchased obtain it from abortion-free herds; (5) in purchasing stock from questionable sources select only young, unbred animals, isolate them from the herd, and subject them to two agglutination tests two months apart. In view of many erroneous beliefs about infectious abortion, consult a well-qualified veterinarian or recent official literature on the subject.

There is some relationship between infectious abortion in cattle and swine, Malta fever in goats, and undulant fever in man. Therefore, it is advisable to pasteurize or boil raw milk from herds in which infectious abortion exists before the milk is used by persons or livestock.

Rabies or hydrophobia, is a communicable disease affecting all warm-blooded animals, including man. The dog is especially susceptible and is the chief spreader of the disease. Rabies may be transmitted only by animals that are actually diseased at the time they inflict their bites. Effective control measures are the destruction of vagrant dogs, quarantining, licensing, and immunization. Experience in other countries, notably Norway, where the disease has been entirely stamped out, shows that the problem is practically solved when the rabid dog is eliminated.

Tuberculosis, though formerly causing heavy losses to the livestock industry, is being conquered by a systematic nation-wide campaign of eradication already familiar to most stock owners. In spite of its insidious character, this disease is readily detected by the tuberculin test. Tuberculosis of cattle, swine, and poultry—which are the only domestic animals commonly affected—can be eradicated from large as well as small areas when the work is properly organized.

The prevalence of this malady in cattle is now only about one-third as great as it was 15 years ago when systematic eradication was undertaken. County-wide tuberculin testing has been especially effective in eradicating this disease and has resulted in extensive economic benefits in addition to being a valuable public-health measure.

Dourine, primarily affecting the reproductive organs of horses, now exists only in very limited areas of Nevada and Arizona. Formerly it was present among animals on Indian reservations in the West and Southwest and occasionally on ranches and farms in the same region. Research has developed a system of blood testing by which it has been possible to detect infected animals. The removal and slaughter of such animals, together with a system of veterinary supervision, have practically eradicated dourine from the United States.

Glanders, a disease of horses and mules, was once common in many sections of the United States. It is readily detected by several tests developed through scientific research, and has now become rare.

Pullorum disease, also known as bacillary white diarrhea, sometimes abbreviated to B. W. D., is probably the most serious disease of poultry. The infection is widespread and may be carried by the eggs of infected hens. Chicks are highly susceptible to the infection during the first 48 hours of life but become much more resistant after the fifth day. Though treatment of pullorum disease is futile, it can be controlled in a flock by detecting the carrier hens and eliminating them from breeding pens. The disease may be detected by means of the agglutination test of the hen's blood. Formerly this test was made in laboratories from a blood sample amounting to about a teaspoonful. The development of a simplified test by the Department of Agriculture now makes it possible to test fowls rapidly on the premises, thereby saving time and considerable expense. The simplified test requires only a small drop of blood.

Combating Noninfectious Diseases

In addition to the infectious communicable diseases, which usually spread rapidly unless opposed by vigorous preventive measures, there are noninfectious maladies that cause serious loss. Many are nutritional disturbances; others are of miscellaneous character. One of the most common is the condition known as bloating, caused by turning hungry stock onto succulent clover or alfalfa pasture. When pasture is moist from dew, rain, or frost, the danger is greatest. Cattle and sheep bloat most readily. Prevention consists in giving animals a good feed of hay before allowing them access to the pasture or in restricting the length of grazing time. In serious cases of bloating the use, by a qualified veterinarian, of a trocar for puncturing the paunch to remove the gas may be advisable to prevent death by suffocation.

Milk fever, a form of paralysis, commonly attacks the best dairy cows in the herd. An effective treatment consists in injecting sterile air or oxygen into the udder. This procedure distends it and corrects the paralysis. Aseptic precautions should be strictly observed in treating the disease. Recent investigations into the nature of milk fever indicate that intravenous injections of appropriate calcium salts in solution bring about prompt recovery. This treatment has already been used successfully by many veterinarians.

Poisonous plants of numerous kinds occur in pastures and on the open range. Losses of livestock from these plants are usually greatest when more palatable forage plants are scarce or absent. Many so-called poisonous plants are injurious only when eaten in considerable quantities or during certain stages of growth. Before practical means for preventing such losses can be put into effect a proper identification of the plant causing them is essential. The Department of Agriculture has conducted extensive investigations on stock-poisoning plants and the results are available to the public. Among the plants against which special precautions should be taken are: Loco weeds, larkspurs, milkweeds, lupines, death camas, and cocklebur.

Goiter is a nutritional disease characterized in lambs by a woolless and in pigs by a hairless condition. Swelling of the thyroid gland in the throat is a common symptom. In many districts goiter is caused by a lack of iodine in the soil. Effective treatment consists in supplying a small quantity of potassium iodide to pregnant animals for several months before the young are born.

In some parts of the country belief in various imaginary diseases still persists. So-called loss of cud, wolf-in-tail, and hollow horn are typical of this class of so-called diseases against which various crude and often cruel procedures are taken. The department is ready to furnish accurate information on actual diseases affecting domestic animals and commends all efforts to dispel superstitious beliefs concerning unreal ills of domestic livestock.

Prevention and Control of Parasitic Diseases

Parasitism in livestock and poultry is widespread throughout the United States. Parasites not only kill large numbers of animals, especially young ones, but are also responsible for lack of condition, poor growth, and other disturbances. When animals of good breeding, on an adequate diet, do not thrive, parasites usually are back of the trouble. The different kinds of parasites which are known to infest livestock run into the hundreds. This discussion deals only with the most injurious ones and those for which control measures are known.

Horses, mules, and related equines, perhaps more than any other class of domestic animals, offer a haven to numerous kinds and astonishing numbers of parasites. Among the most injurious of these are bots, stomach worms, ascarids, and strongyles. Many of these parasites wander extensively throughout the horse's body at some stage of their life cycle, but they finally return to the alimentary canal and develop there to maturity. Here they discharge their eggs with the horse's droppings. The eggs thus discharged form the starting point for new infestations.

Bots are the maggots of flies. The adult fly glues its eggs to the base of the horse's hair. After the tiny maggot hatches it is taken into the mouth by the horse's licking itself, or finds its way into the mouth in some other manner. In time the bots attach themselves to the stomach and gut wall by means of sharp hooks which injure these delicate surfaces.

Stomach worms, ascarids, and strongyles are known also as roundworms or threadworms. They multiply by means of eggs which are present in manure of infested horses. Roundworms are responsible for colic and other digestive upsets which render horses unfit for work.

The control of bots is best accomplished by medicinal treatment. The control of roundworms involves a combination of pasture sanitation and medicinal treatment. Carbon bisulphide for removing bots, stomach worms, and ascarids, and oil of chenopodium, carbon tetrachloride, and normal butylidene chloride for removing strongyles, are the most effective drugs for parasite control in horses. However, unless precautions against reinfestation are taken, much of the good accomplished by treatment may be undone in a few months. Among the precautions are pasture rotation, cleanliness of stables and yards, and manure disposal. The accumulation of manure in piles is dangerous, as the eggs and larvae in manure are scattered by wind and washed onto pastures by rain.

State-wide campaigns for the control of these parasites are very effective. Farmers in Iowa, Illinois, and other States in which these campaigns have been conducted, have reported that horses which had been placed in the discard have been restored to working efficiency. (Figs. 32 and 33.) Much of the colic and other troublesome ailments of horses disappeared, for the most part, after treatment for worm removal and sanitary precautions to limit reinfestation.

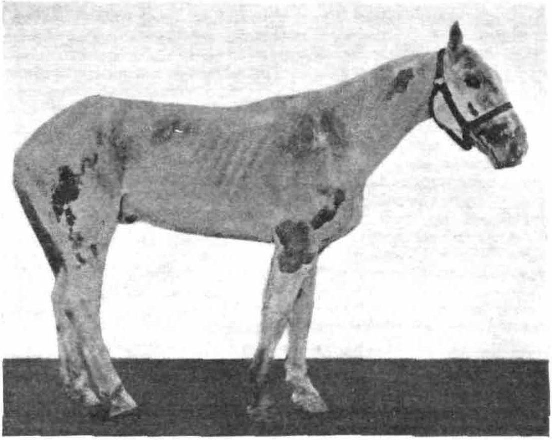


FIGURE 32.—A horse heavily infested with bots and strongyles. At the time the picture was taken the horse could scarcely stand

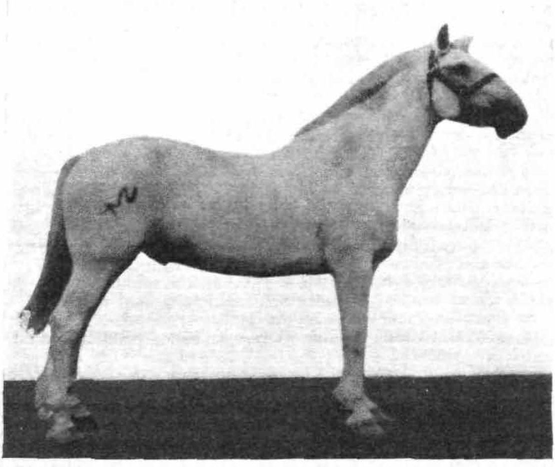


FIGURE 33.—The same horse shown in Figure 32 after being treated for internal parasites and fed well for six months. During this time the horse gained 255 pounds in weight

Parasites of Ruminants

Serious internal parasites of ruminants are roundworms, tapeworms, flukes, and Protozoa. Roundworm eggs pass out with the manure of infested animals and develop into infective larvae on pastures in from a few hours to a few weeks, depending upon the degree of warmth and moisture. As animals in most cases become infected by swallowing these larvae while grazing on contaminated pastures, obviously the best method of avoiding infection is to keep animals away from this source of contamination.

Young animals should be kept away from infected pastures at least for the first six months of their lives. They should be raised in the barn, in dry lot, or on pasture on which no cattle, sheep, or goats have grazed for at least a year. High, dry, and well-drained pastures should be used whenever possible.

Medicinal treatment for the removal of worms is advisable. Since most animals are subject to continuous reinfestation on pasture, treatments should be administered regularly and persistently. A 1 per cent solution of copper sulphate or tetrachlorethylene is effective in removing roundworms. The treatment should be given once every two to three weeks during the summer, and once every month in winter. It is advisable to have a competent veterinarian administer it, as all drugs which will kill worms are more or less dangerous.

Three species of tapeworms are known to occur in the small intestine of American ruminants, but as the life history of these worms is unknown at present no recommendations for prevention can be given.

Two species of flukes occur in the livers of ruminants in the United States. Liver flukes require snails as intermediate hosts in their life cycle; therefore, destroying the snails is an important control measure. The sheep liver fluke is especially common on the Pacific coast, in the South, and in the Southwest. Copper sulphate (bluestone) is very effective for killing snails, and thus eradicating flukes. Drainage should be provided in order to destroy the snails, since they can not live in the absence of water.

Carbon tetrachloride is effective in destroying liver flukes in sheep and should be administered by a veterinarian. It is well tolerated by sheep but not by cattle, particularly milking animals. Experimental evidence indicates that carbon trichloride or hexachlorethane is effective in destroying liver flukes in cattle, and is apparently much safer than carbon tetrachloride.

A large number of Protozoa have been reported as parasites of ruminants, but only a few of these are known to be injurious. One of the most harmful produces coccidiosis in the large intestine of cattle. Affected animals are dull, eat little or nothing, and rapidly become emaciated. There is no satisfactory medicinal treatment for coccidiosis. Affected animals should be segregated in separate pens, which should be provided with fresh bedding daily. All soiled bedding should be burned.

Two diseases of cattle in the United States are caused by protozoan parasites in the blood. The best known of these is cattle-tick fever, caused in the South by a parasite transmitted by cattle ticks. Systematic and properly supervised dipping of all cattle, horses, and mules in an arsenical solution is an effective eradication method. Both experimental work and practical experience show that the ticks can be eradicated entirely from the United States. Eradication already is

about 88 per cent completed. Until it is completed, the continuous quarantine of ticky areas is necessary for the protection of the cattle industry in other parts of the country.

A disease which closely resembles cattle-tick fever is anaplasmosis. This disease is thought to be caused by small, round bodies occurring in the red blood cells, usually on their margins. This disease can be transmitted in at least three ways: (1) By ticks—the cattle-fever tick, the brown dog tick, the common dog tick, the Rocky Mountain spotted fever tick, and the shoulder tick; (2) by horseflies and deer flies; and (3) by infected surgical instruments. In herds where anaplasmosis has been known to occur, all operations should be performed with the utmost care. All needles and other instruments soiled with the blood of one animal should be thoroughly cleaned and disinfected before being used on another.

Animals suffering from anaplasmosis should be kept in a cool, quiet place and disturbed as little as possible. They should have plenty of clean, fresh water and a little green feed, and be protected from fly annoyance.

Parasites of Swine

Of the internal parasites that infest swine, the large intestinal roundworm, the kidney worm, and the nodular worms and lungworms are most responsible for lack of thrift, and for deaths, especially among young pigs. The large intestinal roundworm gains entrance into pigs with feed or water contaminated with the eggs of the parasite. After following a complex route through the body of the pigs, the worms reach the intestine for the second time, settle down, and develop to maturity in about two months. The mature worms produce eggs, thus starting the vicious cycle once more.

Young nodular worms or larvae also are swallowed with contaminated feed or water. They burrow into the wall of the large intestine and spend the early part of their life in the wall of the gut where they do considerable damage. Ultimately they get to the lumen of the gut where they mature and produce eggs.

Kidney worms occur in swine in various parts of the United States and are especially abundant in the South. These parasites arrest growth and development, render a large proportion of livers unfit for food, necessitate trimming of loins to remove worms and lesions, and sometimes render an entire carcass unfit for food. Swine acquire kidney worms by swallowing the infective larvae that develop from the eggs in hog lots and on pastures. The larvae can also enter the bodies of swine through the skin. The presence of lice and mange mites on the skin favors infection with these parasites.

Lungworms in swine produce a husky cough, and when numerous produce a localized pneumonia. Pigs become infected with lungworms as a result of swallowing earthworms which harbor the infective stage of the parasites. Pigs raised on areas where earthworms are abundant are frequently heavily infested with lungworms.

The control of swine parasites consists principally in providing clean farrowing pens and fresh pasture for young pigs. The pregnant sow is placed in the clean pen a few days before farrowing. The sow and her litter are removed from the clean pens about 10 days to 2 weeks after farrowing and hauled, not driven, to a clean pasture. If farrowing is to occur on pasture, the pregnant sow is placed on a clean pasture

a few days before farrowing. These arrangements make it possible for the pigs to escape infestation with parasites at a period of life when they are most susceptible. These simple sanitary procedures, originally devised and tested by this bureau, have been adopted by thousands of farmers in various parts of the United States.

No effective medicinal treatments for removing kidney worms, nodular worms, and lungworms are known. Roundworms can be removed with oil of chenopodium, but the damage inflicted by the young worms in the course of their migration through the body can not be undone by medicinal treatment for worm removal. It is, therefore, essential to practice sanitation in connection with swine husbandry if heavy losses are to be avoided.

Parasites of Poultry

Poultry are subject to attacks by various parasites. One important class occurring in the gastrointestinal tract of fowls consists of Protozoa, seen only with the microscope, and worm parasites, most of which are large enough to be seen with the eye. Of the Protozoa, coccidia cause a severe disease, coccidiosis. Strict sanitary measures help to prevent the spread of the organisms in droppings of infected fowls, and the resistance of the birds may be increased by feeding a nutritious, well-balanced diet.

Among the worm parasites there are tapeworms and roundworms, and there are several different species of each of these. All the tapeworms, probably, and some of the roundworms, pass part of their life cycles in some small animal, such as an insect, snail, slug, or earthworm; these intermediate hosts, when eaten by the fowl, infect it with the young parasite. Measures to prevent breeding of intermediate hosts are, therefore, of value. Such measures include filling in low, damp areas, removing rubbish, and promptly disposing of droppings of fowls and manure of other animals in such a way as to prevent the intermediate hosts from having access to infective material.

For removing tapeworms from poultry, kamala, although not entirely satisfactory, is the most effective drug now known; it must be used with caution, the treatment being tried first on only a few fowls, to observe the effect. Tetrachlorethylene is of value in removing certain roundworms. When both roundworms and tapeworms are present, the treatments should be given separately, the tetrachlorethylene first, followed in three days by the kamala.

Blackhead, occurring most frequently in turkeys, produces changes in the caeca and liver, and is often manifested by a darkening of the head; it is caused by protozoan organisms. Chickens harboring these organisms may not be affected, but through droppings may spread them to turkeys; for this reason turkeys should not be reared with chickens or on areas used for chickens within a year at least. No satisfactory medicinal treatment is known; measures such as suggested for coccidiosis will help check the disease.

Gapeworms, bright red worms paired so as to form a Y, occur commonly in the windpipes of turkeys; in these birds they do little harm, but when they infest young chickens, they may cause a serious disease known as gapes. Separate rearing of chickens and turkeys is therefore desirable.

Insects and Related Forms That Attack Livestock

The investigation of insects affecting livestock and poultry is a major activity of the Bureau of Entomology. This work is done at various field stations and consists of independent investigations and also cooperation with the Bureau of Animal Industry and certain State experiment stations. J. L. Webb, associate entomologist of the Bureau of Entomology, has furnished the following information on insects and related forms which attack domestic animals.

Flies are of primary importance among these livestock enemies, and foremost among the flies, as destructive agents, is the so-called screw worm of the Southwest. Screw worms attack the living tissues of the host and levy an annual toll of about $10,000,000 on the livestock industry of that region. Cattle grubs occur in practically all parts of the country and cause even greater losses. Stable flies and horn flies are the curse of the dairy industry and cause an indeterminable loss by annoying the cows and sucking their blood. Horseflies and deer flies make life miserable for cattle and horses and in many parts of the country are a serious detriment to the fattening of market steers; these flies may also carry dangerous diseases. Buffalo gnats often appear in swarms large enough to kill horses and mules. The losses caused by mosquitoes are at times considerable. A scourge of mosquitoes in a Florida community in the fall of 1932 killed about 200 head of livestock within a few days. Finally, but by no means of least importance, the horse bots are a constant drain on the vitality of horses and mules. In the adult or fly stage, when laying eggs, this parasite causes serious annoyance to the animals.

Practically every kind of animal bearing hair or feathers is subject to the attack of one or more species of lice. Some of these lice have biting mouth parts, whereas others suck blood. Three species of sucking lice and one species of biting lice attack cattle, and one species of each attacks horses. Goats have to contend with both biting lice and sucking lice. Chickens may be hosts to several species of biting lice. The onset of louse attack is seldom apparent to the owner of the animal and unless he is watchful the infestation may reach injurious proportions before it is noticed.

In addition to the cattle-fever tick, already mentioned, there are several other species of ticks that are troublesome to livestock. In the South the lone-star tick and the black-legged tick cause severe infestation in cattle. In the West the winter tick attacks horses in great numbers. In the Southwestern States the spinose ear tick is a serious pest of cattle and horses, and the fowl tick takes a heavy toll from the poultry industry.

Various species of mites attack chickens, the most important being the chicken mite, the feather mite, the scaly-leg mite, the depluming mite, and the chigger.

The sticktight flea is a serious pest of chickens in the Southern and the Southwestern States, its attacks often proving fatal to young chickens. Fleas sometimes attack horses and mules and the animals may refuse to stay in infested barns even long enough to eat.

The investigations of the pests mentioned have had as their object the development of simple and economical methods of control. The following examples of successful effort may be cited: The development of effective control measures for the screw worm in which improved range practice, fly trapping, and the treatment with benzol and pine-

tar oil for killing larvae and repelling flies are utilized; the control of chicken lice by the sodium fluoride treatment; and the control of flies about dairies by the elimination of fly-breeding places and the use of fly sprays and flytraps. Methods of controlling horse bots have been perfected and are now being put into extensive practice with gratifying results.

Federal Supervision of Livestock and Poultry Remedies

Department of Agriculture activities that have also contributed greatly to the health of livestock and the welfare of their owners are the enforcement of the Federal food and drugs act and the national insecticide act. Both laws are designed to control interstate shipment of misbranded livestock and poultry remedies. H. E. Moskey, veterinarian of the Food and Drug Administration, the branch of the department that enforces the act, has furnished the following description of Federal activities in this field.

A vigorous 5-year campaign by the Food and Drug Administration has driven from the market practically all drug preparations labeled for the cure and prevention of infectious abortion of cattle, or has forced manufacturers to revise their labeling so as to eliminate claims relating to this disease. During this campaign, hundreds of samples were collected and analyzed. Most of these consisted essentially of medicated colored water, colored table salt, table salt with carbolic acid, brown sugar and bran, creosote, or drugs acting as irritants or vascular stimulants. Some of these were simple, inexpensive drugs disguised in different ways. Others were mineral mixtures with or without added drugs of any kind. Their apparent success is due to the fact that infectious abortion tends to die out in herds to which no susceptible animals are added or the herds acquire an immunity or an apparent tolerance to the disease.

Likewise, claims have been made that medicinal preparations have value in the treatment and control of many other diseases, including coccidiosis, infectious bronchitis of poultry, and necrotic enteritis of swine. Spontaneous recoveries from many diseases may occur when proper attention has been given to sanitation alone, but when a drug has been used, it ordinarily is given the credit. The department has been active in removing from the market medicinal products labeled for the prevention of these diseases and many others.

In the enforcement of the food and drugs act, the department has given considerable attention, during the past year, to drugs labeled as being effective in the control of intestinal parasites. There is no drug or mixture of drugs known to veterinary science that is effective as an expeller of all types of worms. The Food and Drug Administration has advised manufacturers of worm remedies or worm expellers to confine their label claims to the particular type of worm for which their product has been proved to be effective. Tests of some products containing mixtures of drugs showed that they were ineffective in expelling any type of worm. Critical tests have shown that some drugs, when used alone, will expel certain types of worms, but if mixed with other anthelmintics may be ineffective. In fact, the department has not found any of the preparations so far tested to be effective in removing the heads of various species of tapeworms infesting poultry. Action has been taken to remove these mislabeled products from interstate trade. Many mineral mixtures, so-called livestock conditioners, and tonics,

have been labeled for the control of intestinal worms of swine, sheep, and poultry. The department has discovered that such preparations are not effective in the control of worm infestation of any animal. Through the action of the courts the department has seized many large shipments of these types of products found in interstate trade.

The Food and Drug Administration conducts tests of products labeled for vitamin content to determine whether or not the article can truthfully be represented as actually containing adequate amounts of the various types of vitamins claimed in the labeling. Legal action has been instituted against manufacturers of several of these products that were not found to contain adequate amounts of cod-liver oil or yeast, or that were not potent in the vitamins claimed in the labeling.

In enforcing the insecticide act, the department tests disinfectants bacteriologically and chemically. Disinfectants have often been labeled with many unwarranted and misleading statements. For instance, the recommendation that a disinfectant be sprayed around the premises and be added to the drinking water to prevent disease such as hog cholera, infectious abortion, chicken pox, pullorum disease, and roup, leads the user to believe that he has done everything necessary to prevent disease when, in reality, he has merely taken inadequate measures against a few of the many possible sources of disease communication.

Under the insecticide act, many other preparations for livestock and poultry, such as fly killers and repellents, flea and lice powders and liquids, dips for animals, mange ointments, lotions and liquids, preparations for screw worms and grubs, and for various forms of scabies of livestock, receive constant consideration. Many farmers and poultrymen also erroneously believe that certain chemicals administered as medicine, or mixed with feed or water, will protect their animals from external parasites, such as flies, lice, and ticks. Hundreds of liquids, tablets, and powders have been recommended for use in this way. The department has issued warnings against these remedies, and in many cases has forced the makers, through court action, to cease selling preparations of this nature.

John R. Mohler, *Bureau of Animal Industry.*

EXPERIMENTS With Beef and Dual-Purpose Cattle Aid in Efficient Production

Cattle raised chiefly for beef, or herds serving the dual purpose of producing beef and milk for human food, are kept on about one farm in every four in the United States.

Three general types of beef-cattle enterprises are conducted, namely: The production of feeder and slaughter cattle on western ranges; the further fattening of these feeder cattle in the corn and other grain producing sections; and the breeding, raising, and finishing of beef on general livestock farms. Dual-purpose cattle are produced chiefly in areas not too remote from urban centers to afford a ready market for milk or butterfat, yet where land values and pasture and feed resources are favorable. Any of these enterprises requires considerable investment in land and livestock. None should be undertaken without careful, intelligent planning, and, if possible, some first-hand experience. All offer excellent foundations for systems of balanced farming.

In the broad scheme of agriculture, beef and dual-purpose cattle more than pay their own way. Like other farm animals, they leave on the farm for the maintenance of soil productivity, approximately 75 per cent of the fertilizer value of the feed they consume. Like sheep, they have great adaptability to rough land and sparse grazing. To a greater extent than any other class of domestic animal, however, they make efficient use of unmarketable roughage, much of which the farmer would otherwise have to waste. And, in labor requirements, beef-cattle production fits in well with crop farming because it demands comparatively little attention during the cropping and harvesting season.

About half of the beef-cattle are raised in the range area which is principally west of the one-hundredth meridian, and about 30 per cent of the cattle that go to market from that area go directly from grass into slaughter channels.

The general trend in the production of steers for more than a decade has been toward cattle lighter in weight, earlier maturing, and of higher quality. Twenty-five years ago most of the steers marketed were 3 years old or more. At present most of them are 2-year-olds, with a large proportion of yearlings and considerable numbers of fat calves.

A major problem in beef production has long been that of developing types of breeding animals and systems of feeding that would make the greatest possible use of grass, coarse roughages, and other inexpensive feeds without undue sacrifice of quality in the finished product. This problem is especially important to-day and promises to continue so for some time to come. One reason is that there is now a tendency to turn land from cultivated crops to grass, where the land must be used for livestock or be abandoned. Another is the growing competition of other agricultural products. A third is the fact that much skill and a certain amount of concentrated feeds are required to produce the choice young beef demanded to-day.

In dual-purpose-cattle breeding the chief endeavor is to develop families that will breed true in the production of heavy-milking cows which will also get calves capable of being finished as good-quality beeves. Such dual-purpose animals are popular on many general livestock farms, particularly in sections where increased land values make it difficult to realize a profit from specialized herds.

Breeds of Cattle and Their Improvement

According to the 1930 census, one-thirtieth of the beef and dual-purpose cattle in the United States were registered purebreds. The beef breeds were represented by 770,000 purebreds and the dual-purpose breeds by 34,000.

Among the beef breeds, there are more registered Herefords than all the other registered beef cattle combined. Herefords greatly predominate in the Great Plains and Rocky Mountain States. One of their qualities is their rustling ability. The Shorthorn predominates in the greater part of the Corn Belt, because of its adaptability to localities where feed is abundant, and its ability to produce good quantities of milk as well as beef. The Aberdeen-Angus breed is found in large numbers throughout the Corn Belt and other areas which produce an abundance of fattening feeds. Cattle of this breed are especially popular for feed-lot use and for their ability to yield well-marbled beef of high quality.

The milking Shorthorn and Red Polled breeds form the bulk of the registered dual-purpose cattle, and are found largely in the East North Central and West North Central States.

The choice of a breed is not so important as the selection of individuals within a breed when a farmer is going into cattle production or striving to improve his herd. Any of the recognized breeds are good, and it is generally advisable to choose the one raised by most of the best breeders in the district. There are facilities, then, for procuring new blood near at hand; marketing is simplified; and, if the climate or other conditions are particularly trying, strains of cattle, especially adapted there, probably will have been developed within the district. It is for this reason that cattle which have given excellent results on farms in the North sometimes disappoint when shipped to the far South or to semiarid western ranges.

As with other classes of livestock, the purebred is the reliable means of achieving lasting improvement in a herd of cattle. Although many grade animals are of higher quality than some inferior purebreds, they usually owe their good points to a close relationship to a good purebred; and, while purebreds, whether good or poor, breed reasonably true, the best grades can not be counted on to produce offspring like themselves.

A conclusive demonstration of the value of good purebred sires in grading up a herd of native beef cows was begun in 1914 at Sni-a-Bar Farms, Grain Valley, Mo. The cows used in this demonstration are described as "common red cows" and were purchased at the Kansas City stockyards where they had been shipped for slaughter. The bulls selected for the demonstration were registered Shorthorns of good individuality. The results of this cooperative work showed that after the third or fourth cross the grade offspring compared very favorably with purebred stock in conformation and quality, and that the greatest single improvement occurred in the first cross. Only exceptionally good sires can be expected to bring about any very marked improvement after the fourth cross.

In an experiment in which the department cooperated with the Arkansas Agricultural Experiment Station it was demonstrated that although the cost of maintenance is less for native calves, the sale price of purebreds and grades is sufficiently higher to make up more than the difference. In this experiment the first-cross calves made a return per head of more than six times that of the native calves. This and many other experiments in breeding purebred sires to native cattle have shown conclusively the value of prepotent sires in grading up a herd. They have also shown that a farmer can make an excellent beginning with a herd of very inferior native cattle if he breeds them to good bulls.

There are areas in the Southwest, particularly in the Gulf coast regions of Texas and along the Mexican border, where our popular breeds of beef cattle have great difficulty in withstanding the hardships of intense heat, insect pests, and scarcity of water. Cattle of the Brahman breed and, more recently, Africander cattle from South Africa, have been imported to cross with native cattle and the purebreds predominant in that region for the purpose of improving their adaptability to the environment.

Breeding experiments at the United States Iberia Livestock Experiment Farm at Jeanerette, La., in which grade Hereford cows were bred to Brahman bulls for a period of several years, showed that

Brahman crossbred calves were larger at weaning time and at 1 year of age than calves from similar cows, sired by purebred Hereford bulls, but that there was a tendency for them to gain more slowly than the Herefords from that age on. Brahman crossbreds have done exceedingly well when fattened on grass or in short dry-lot fattening periods, but in long feeding periods they are excelled in total gains and finish by cattle in which the blood of the established beef breeds predominates.

Record of Performance

Within the last two years a new and highly promising method of improving beef and dual-purpose breeds of cattle has been evolved. It has become generally known as the record-of-performance method. By it each sire and each dam are given a performance score based on the proved utility value of the offspring. This value is expressed as a single numerical term on the basis of 100 points as the ideal. It is

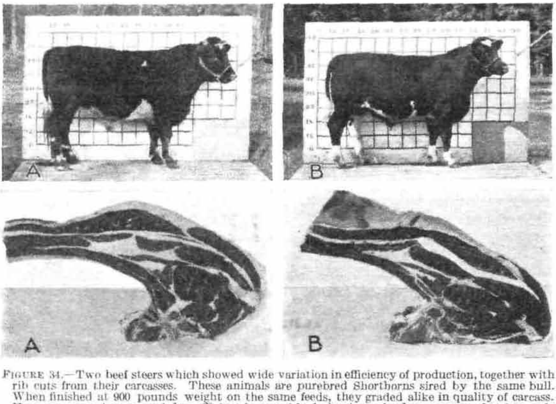


FIGURE 34.—Two beef steers which showed wide variation in efficiency of production, together with rib cuts from their carcasses. These animals are purebred Shorthorns sired by the same bull. When finished at 900 pounds weight on the same feeds, they graded alike in quality of carcass. However, steer A was much less efficient in use of feeds, having gained an average of 14.3 pounds of beef for each 100 pounds of total digestible nutrients eaten, as compared with 17.4 pounds for steer B. Their final performance scores, when both efficiency and quality are considered, were 79 and 93, respectively. The rib roasts were practically equal in tenderness and general desirability

arrived at by measuring an animal's performance in two important respects: (1) The number of pounds of beef it produces from birth to maturity or slaughter for each 100 pounds of total digestible nutrients eaten; and (2) the quality of beef it produces as measured by carcass grade and tenderness of the cooked meat scored by experienced judges.

This method of evaluating performance requires that each calf be fed individually in order to determine its feed consumption. For that reason it is not yet ready for use by farmers generally, although results with cattle as well as with other classes of livestock indicate that farmers may eventually be able to recognize the efficient animals merely by observing the rapidity with which they grow during certain periods of their development.

The chief value of this work to date has been to reveal, for the first time in animal-husbandry research, some surprising differences in efficiency among cattle of like breeding, and to indicate that animals more efficient than any we now have can be bred.

Among both beef Shorthorn and dual-purpose Shorthorn steers thus far subjected to these performance tests, there have been efficient animals producing 40 per cent more beef, from the same quantity of exactly the same kind of feeds, than did closely related animals of the same type and of apparently equal vigor and health. There was less variation among these animals in quality of product than in efficiency of growing that product; yet when the two factors were

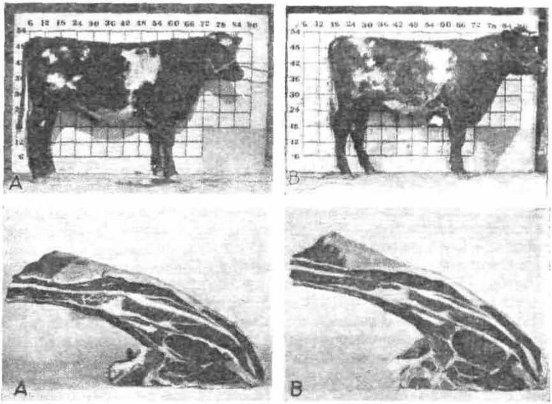


FIGURE 35.—Two dual-purpose steers which showed wide variation in efficiency of production, together with rib cuts from their carcasses. These animals are Shorthorns, of dual-purpose type, sired by the same bull and from cows which are half-sisters. When finished at 900 pounds' weight on the same feeds, they graded alike in quality of carcass. However, steer A was much less efficient in the use of feeds, having produced an average of 14.9 pounds of beef for each 100 pounds of total digestible nutrients eaten, as compared with 18.6 pounds for steer B. Their final performance scores, when both efficiency and quality are considered, were 75 and 91, respectively. The rib roasts were judged to be of practically equal quality

combined to obtain the final performance score the beef calves still ranged from 75 to 93 points and the dual-purpose from 71 to 91. (Figs. 34 and 35.)

These records indicate even more significance than has been generally appreciated in the saying, "The eye of the master fattens the cattle." It undoubtedly applies not only to fattening but also to breeding and selection of animals which will do well in the feed lot. Frequently, in these tests, two calves sired by the same bull and of seemingly equal individual merit at the start showed widely different ability to make rapid and economical gains. A wise feeder observes such differences. If he is an able breeder he remembers these differences and, for improving his herd, he looks to the matings that produced the quick-gaining calves. Farmers have not attempted, however, actually to measure the differences among cattle in feed-lot efficiency, nor to correlate these with the quality of the carcass pro-

duced. Show-ring performance has too often been the principal guide in selecting breeding stock, without sufficient regard to actual utility value. Two of the most noteworthy findings in this record-of-performance work are that quality in an animal's carcass is not obtained at the expense of efficiency of gains, and that strains that will breed uniformly for high efficiency in both respects can be developed.

Some Points in Management

In the feeding and management of beef and dual-purpose cattle, two goals stand out above all others. One is to make maximum use of inexpensive home-grown feeds and pastures. The other is to get a good calf from each cow each year.

During the grazing season good pasture alone will take care of all classes of beef cattle except those being given a high degree of finish for market. Dual-purpose steers and dry cows may be handled like similar classes of beef cattle. When maximum milk production is expected of dual-purpose cows they should receive, for each 5 pounds of milk they produce, approximately 1 pound of grain mixture containing 15 to 20 per cent of protein. When not on pasture they should get all the alfalfa or other legume hay they will consume and a grain mixture at the rate of 1 pound for each 3 to 4 pounds of milk they give.

Though the percentage of calves raised is important in all phases of cattle production, it is of particular significance in range-cattle management, where unfavorable environment and lack of close supervision frequently result in the raising of as few as 40 to 50 calves per 100 cows. Of the many factors influencing calf crops, those of chief concern are the condition of the breeding herd and the topography and size of the range or pastures used during the breeding season. Other factors are the ratio of bulls to cows, barrenness in females, and the system of breeding used.

Small calf crops are usually preceded by inferior feeding conditions. Scarcity of feed invariably results in a low plane of nutrition for cows, and when this occurs the estrous cycle is not normally developed. The condition of the bulls during the breeding season has been found to have a closer relation to a high-percentage calf crop than the ratio of bulls to cows, and feeding grain at this time is a common practice among successful ranchmen.

Not only are numbers of calves important, but also their uniformity in both age and quality. The breeding season can be materially shortened by using comparatively small pastures and maintaining cows and bulls in thrifty condition. A recent 3-year ranch study in which the department cooperated with the Colorado and Wyoming experiment stations, showed a difference of 7 per cent in calf crop in favor of controlled breeding on pastures as compared with range breeding. The breeding of heifers, unless they are particularly well cared for, was found to result in a comparatively small calf crop and a high death loss. Culling the herd by eliminating nonbreeders, poor mothers, and irregular breeders was found to be a helpful practice. Good management on a favorably located ranch is frequently rewarded with 70 to 80 calves raised for each 100 cows bred.

In range-cattle production it is of prime importance that ranges and pastures be so used as to get the greatest returns without permanent injury to the forage. Studies made in cooperation with ranchmen in a

number of range States have demonstrated that this can be accomplished only through ownership or long-time leases of the land. Those ranchmen who depend on the use of open ranges invariably allow their stock to overgraze and seriously injure the carrying capacity of the range.

At the Northern Great Plains Experiment Station, Mandan, N. Dak., grazing experiments have shown that the carrying capacity of the range can be increased as much as 40 per cent by practicing a system of deferred and rotation grazing. It is impractical, however, to carry out such a system unless the range is controlled by the operator over a period of years.

In range management, it is desirable to reserve protected range for winter grazing. When this can be done one of the most expensive items in the cost of range-beef production—the winter feed supply—can be reduced materially.

At the United States Range Livestock Experiment Station, Miles City, Mont., 53 per cent of the breeding cows have been kept on the range throughout the entire winter for a 4-year period 1925–1929. During one adverse season, only, was it necessary to feed a supplement—cottonseed cake being fed for 42 days. Cows kept on the range during 60 per cent of the winter season and in the feed lot 40 per cent of the time consumed 26 pounds of cottonseed cake and 2,570 pounds of dry roughage. The cows kept on the range lost 80 pounds per head as compared with 30 pounds for those kept in the feed lot. This loss in weight did not affect the birth or weaning weight of the calves. Only in areas having heavy snowfalls, therefore, is it necessary to winter breeding herds in the feed lot.

In carrying calves until they are yearlings or older, it is very important that they be wintered economically as the winter feed bill is the item of expense that offers the greatest possibility for reducing costs of production. Home-grown roughage should be used, and when not of good quality or of high feeding value it should be supplemented with a protein concentrate such as cottonseed cake. Experiments at Miles City in wintering steers on different planes of nutrition show that steers carried on medium and low planes make only slightly less total yearly gains than steers carried at a high level, with net costs of production much lower.

The grinding of grain and roughage and other methods of preparing feed for beef cattle are not generally profitable, as the increased quantities consumed and the greater production do not offset the costs of preparation. Ground grains, however, are commonly used in the grain mixture of dual-purpose cows in order to obtain maximum production.

Salt should be kept before cattle at all times. Under most conditions where cattle get a variety of feeds, including legumes, no other mineral need be supplied. If legumes are not being fed, a mixture of equal parts of finely ground limestone and bone meal is desirable. There are areas in the South and Southwest, however, where the growth of cattle grazing on certain types of soils is retarded and calf crops are low, owing to deficiencies of other minerals, notably phosphorus. Research work is being done on this problem.

Following a study of the serious condition known as salt sickness among cattle in Florida, the agricultural experiment station of that State recommends that cattle in regions subject to salt sickness be given constant access to a mixture of 100 pounds of common salt, 25 pounds of red oxide of iron, and 1 pound of finely ground copper sul-

phate, thoroughly mixed. The investigators add the warning that copper sulphate, commonly known as bluestone, is poisonous in concentrated form and should be pulverized and mixed thoroughly with the other ingredients.

Most dual-purpose cows in the market-milk and creamery sections are milked, most of the milk and cream being sold. The steer calves are pail-fed whole or skim milk and marketed as veal. Three other types of handling are practiced. Under one, the steer calves are pail-fed whole milk for a few weeks and then have skim milk, pasture, grain, and hay for six months, after which they are sold as feeders or finished on hay, grain, and silage in dry lot. Under another, the heaviest producers are milked and the milk and cream sold. The remaining cows nurse one or two calves each, which are marketed as veal or as fat calves. Under still another system the low producers nurse calves twice daily, and the calves are given grain and hay in the barn as soon as they will eat or are creep-fed with the cows on pasture and sold as fat calves or fat yearlings.

Whether it is more profitable to sell milk or cream or to feed the milk to calves is, of course, determined by market prices of milk, butterfat, hay, grain, veal, and beef. At the United States Animal Husbandry Experiment Farm, Beltsville, Md., experiments have shown that younger calves pay considerably more for milk than do older calves and that after calves reach 150 pounds in weight there is a gradual decrease in the value of whole milk for calf feeding.

Finishing Cattle for Beef

There are two distinctly different methods of fattening cattle for market. One is to finish them on harvested feeds alone, and is known as the dry-lot method. The other is to market them for slaughter directly from grass. The former is used chiefly in regions of abundant harvested feeds, the latter in the Rocky Mountain range country, the Great Plains, and the Appalachian region.

There is a strong tendency in recent years, however, for farmers even with abundant pastures to supplement them with grain during at least the latter part of the finishing period. There is a tendency also for farmers in grain-producing regions to take advantage of the comparative cheapness of gains on grass by feeding grain liberally to their cattle while they are on grass and finishing them as fat calves or yearlings.

The most advantageous system will be determined by the farmer's resources in pastures, his finances, and the quantity of harvested feeds he desires to market as beef, as well as by his personal experience and other considerations.

Studies by the department, summarized in Table 5, have shown the approximate quantities of feeds required for each pound of finished beef produced by cattle when marketed at various ages. In each case the cost of carrying the breeding herd is charged against the animal. The data in this table are based on the quantity of feed required by fat weanling calves on Corn Belt farms and by feeder calves in the range area and their finishing in the Corn Belt feed lots as yearlings and 2-year-olds. The yearlings require proportionately more grain than the 2-year-olds because a larger percentage of the final weight is the result of grain feeding. In the case of weanling calves, most of the feed is consumed by the breeding herd and is therefore grass and other roughage.

TABLE 5.—*Feed required, per pound of finished beef, by weanling calves, yearlings, and 2-year-olds*

Kind of cattle	Grain	Roughage
	Pounds	*Pounds*
Calves	3	34
Yearlings	6	25
2-year-olds	4	31

The different classes of feeds comprising the roughage shown in Table 5 were found to be approximately as shown in Table 6.

TABLE 6.—*Proportions of various roughages consumed by cattle marketed at various ages*

Kind of cattle	Pasture	Leguminous and mixed hays	Silage, stover, and straw
	Per cent	*Per cent*	*Per cent*
Calves	55	22	23
Yearlings	50	30	20
2-year-olds	69	22	9

Generally speaking, to market beef in the form of calves requires the heaviest investment in breeding stock, while marketing it as 2-year-old animals requires the least. Pastures better than average, and more intensive supervision and management, are needed in successful calf and yearling production. The beef animal 2 years old or older requires the least amount of harvested feed but produces a carcass heavier than is desired by many markets and consumers. A sirloin steak an inch thick from a well-finished 2-year-old will weigh from 2 to 3 pounds; one from a choice fat calf will weigh only about half as much.

In cooperation with the University of Missouri the department has carried on extensive investigations in fattening calves at Sni-a-Bar Farms, Grain Valley, Mo. Results have shown that well-bred beef calves fed grain from the time they are from 2 to 3 months of age until they are weaned at approximately 8 months of age gained 100 pounds more than calves that had no grain. The supplement-fed calves made very economical gains and were in suitable condition for slaughter at weaning time. The grain was fed to the calves in creeps and was not accessible to the cows.

Throughout the experiments, although small pastures—about 2 acres per cow—were used, it took a month or more and considerable handling to train the calves to begin eating regularly in the creeps. Locating a creep near the watering place and shade tends to insure more satisfactory results. However, when pastures have extensive shaded areas and several sources of water, the only practical way yet found to feed supplementary feed to calves is to keep them in a barn, separate lot, or pasture and turn the cows in for them to nurse regularly twice a day. If a feed trough is fastened on the calves' side of the gate where the cows are let in, the calves will learn to eat readily.

In cooperation with the West Virginia Agricultural Experiment Station, the department has conducted a series of experiments at Lewisburg, W. Va., to determine the value of adding a grain supple-

ment to grass in finishing 2½-year-old steers, and the relative value of various methods of feeding the supplement.

The first three years' work showed that a daily supplement of about 6 pounds of coarsely ground shelled corn and 1.6 pounds of cottonseed meal per steer, when fed to 1,000-pound feeder steers on good grass pasture from May to September, produced a daily gain of 2.6 pounds. Similar steers on grass alone made an average daily gain of 1.9 pounds. The supplement increased the total gain per steer approximately 100 pounds. This additional gain, owing to a greater finish on the steers, enhanced their sales value 10 per cent. The increased selling price considerably more than offset the additional feed cost. The supplement-fed cattle had a higher dressing percentage, were fatter, and possessed more salable carcasses. The strictly grass-fed cattle had a higher percentage of bone in the rib samples analyzed, and the meat was not so bright red in color as that of the supplement-fed cattle.

The second 3-year study was for the purpose of determining the relative value of different times of beginning the grain supplement in a finishing period of 135 days. The results showed no advantage in feeding grain from the beginning of the pasture grazing season, as the lot receiving a supplement of corn and cottonseed meal after being on grass 56 days was significantly the outstanding lot so far as profit was concerned.

In dry-lot fattening there are two general types of rations, dry and succulent. Corn and either clover or alfalfa hay constitute perhaps the most popular dry ration. The most widely used combination of feeds in succulent rations consists of corn, cottonseed or linseed meal, mixed hay, and corn silage.

A comparison of the feed requirements of 3-year-old steers, 2-year-olds, yearlings, and calves, when fed a ration of corn and legume hay, has shown efficiency to vary directly with the age of the fattening animal. The younger the feeder, the more efficient is the feed utilization. The actual daily gains, however, increase in rapidity as the age increases. On a ration of corn and legume hay, calves will produce 100 pounds of gain on 65 per cent of the feed required for 3-year-olds. The corresponding figure for yearlings is 88 per cent, and for 2-year-olds 91 per cent, showing the much greater efficiency in feed utilization of the younger cattle. On a ration of corn, protein concentrate, mixed hay, and corn silage, young cattle are even more efficient as compared with older animals. In this case, calves require only 58 per cent as much feed as 3-year-olds to produce equal gains, and yearlings 81 per cent as much.

Cooperative feeding experiments by the department, the Texas Agricultural Experiment Station, and the Agricultural and Mechanical College of Texas show that hays as well as the grain from the sorghums are excellent feeds for fattening cattle. The experiments have shown also that it is advisable to grind the grain but that there is no advantage in using threshed grain, as the ground heads produced greater gains, at lower cost, than did unground milo heads or threshed milo either ground or unground.

Self-feeding of beef cattle is still in the experimental stages. Recent experiments indicate that self-feeders may be used satisfactorily after cattle are on full feed. Somewhat greater gains may be expected but the increased gains are not usually compensated for, as the cost of gains is usually more expensive when cattle are self-fed than when they are hand-fed.

Present knowledge indicates that from 70 to 80 per cent of full feeding is preferable to full feeding, so far as economy of gains is concerned. However, market demands and prices of feeds should be taken into consideration. If the feeding period is limited to a definite time, or if there is a likelihood of a falling market near the end of the period, it may pay to full feed. The chief objective, after buying the animals at a reasonable price, is to get them on the market when the demand is greatest for the grade of product being offered.

Quality in Beef

Within the last few years considerable new information on the factors responsible for quality in beef has been obtained by the department in cooperation with various State experiment stations.

In cooperative work with the West Virginia station, comparisons of beef from cattle finished on grass alone with that from cattle receiving a supplement of grain have shown that grain-fed cattle have a distinctly higher dressing percentage and yield fatter, more attractive, and more salable carcasses. When cooked, the beef from the cattle receiving the grain supplement shrank more from loss of fat drippings, whereas the beef from the grass-fed animals had more loss from evaporation. When the two kinds of beef were tested for palatability, the differences were small; and only in such respects as aroma, flavor of fat, and richness and quantity of juice was beef from the grain-fed animals consistently superior.

The influence of the animal's age upon the quality of its beef has been studied by the Iowa station, with the following conclusions: The age of the animal has slight influence on the percentages of the various cuts. Beef from yearlings and 2-year-olds has higher dressing yields and a better distribution of fat through the lean, and is more palatable to most tastes than beef from calves finished at approximately 8 months of age. Beef from younger animals is lighter in color than that from older animals, but will not ripen so satisfactorily.

The old question of the comparative merits of beef from heifers and steers also has received attention in a series of studies which have yielded interesting results. It was found that heifers and steers of the same breeding, age, and type, when fed the same feeds, reach desirable market weights and degrees of finish in different periods of time. Heifers fatten more quickly and should be marketed at lower ages than steers if they are fed alike. Heifers of good beef-type breeding which graded, on an average, Good to Choice when finished, reached, at about 725 pounds weight, a degree of fatness equal to that reached by the steers at 850 pounds. In the matter of dressing yields there is no consistent difference, though at equal final weights heifers tend to excel steers. Roasted ribs of the two sexes were scored in detail according to such factors as tenderness, quantity and quality of juice, texture, intensity and desirability of aroma, and flavor of fat and lean, and were consistently found to be of equal merit. In general, then, if farmers will finish and market unbred heifers at about 125 pounds lighter weights than steers, there will be no justification for market discrimination in the resulting beef.

Probably the characteristic in which beef most often fails to satisfy the consumer completely is tenderness. Recent studies by home economics specialists of the department and of various States have shown that there are cooking methods for making the least-tender cuts of beef both tender and palatable. In general, fore-quarter cuts and cuts

from older animals or animals which have not carried the bloom that comes from a high degree of finish, should be cooked slowly with moisture; whereas the cuts naturally more tender may be cooked quickly with dry, intense heat. There has been developed a roast-meat thermometer with which the cook may learn the temperature at the center of the roast and, by its guidance, bring a roast to the exact degree of doneness desired.

E. W. Sheets, W. H. Black, *and* J. A. Gamble,
Bureau of Animal Industry.

TREND *in Hog Production* **Is Toward Efficiency and Quality of Product**

Widely recognized for its efficient utilization of feed and its adaptability to various systems of farming, the hog is one of the most dependable sources of agricultural income. Swine are raised on approximately three-fourths of the farms in the United States. The total number on January 1, of each of the last five years, has ranged from about 52,000,000 to 62,000,000. Swine consume from 40 to 50 per cent of the corn crop and furnish approximately half the meat consumed in the United States. In value, they represent about one-tenth of all agricultural production. The hog's prolificacy and early-maturing qualities, together with the excellent keeping properties of the meat, when properly cured or canned, add further to its usefulness and popularity.

With changing conditions in the country's development the type of hog also has changed. The typical porker of to-day is a vastly different animal from the coarse, large-boned, long-legged hog of pioneer days. According to record, hogs were first brought into this country on the second voyage of Columbus, by way of the West Indies. Later, other hogs in large numbers were brought directly to Florida by De Soto and distributed throughout the South. These animals, of Spanish origin, descendants of wild European hogs, were permitted to run at large. In this unrestricted mingling of hogs there was random breeding, which in the course of a few generations produced a common type.

Meanwhile hogs of a better grade, maturing early because of an admixture of blood of Chinese hogs, were brought into the country from England and distributed along the Atlantic coast at various points from New England to Virginia. These hogs represented breeds already popular and regarded as efficient producers of pork in the British Isles and in the Netherlands. These hogs, too, were obliged to roam beyond the settlements and get their feed chiefly from the mast (acorns, beechnuts, etc.) in the woods bordering the clearings of the settlers.

As the pioneers moved westward, taking livestock with them, the hogs of British origin from the Atlantic coast and the descendants of those from Spain were merged in the eastern and southern sections of what is now known as the Corn Belt. There remained, however, here and there in the settled sections of the country, some more or less pure representatives of the original imported hogs, especially those from Great Britain. In the great bulk of hogs there was considerable deterioration in quality at all the settlements owing to management practices followed under pioneering conditions. Real interest in and effort toward improving hogs did not become of general concern to farmers before about 1800. Since then marked improvements have been made, as indicated by the superior quality of swine in each of the breeds now found throughout the United States.

Breeds of Swine and Their Improvement

The relative distribution and popularity of the standard breeds of hogs are indicated in the numbers of purebred registered swine throughout the United States according to the 1930 census.

Breed	Number registered	Breed	Number registered
Duroc-Jersey	116, 942	Hampshire	30, 740
Poland China	110, 284	Berkshire	8, 423
Chester White	41, 614	Tamworth	2, 758
Spotted Poland China	33, 564	All other breeds	12, 754

Characteristic differences in conformation and in color exist among the several swine breeds, though all of them possess innate qualities for quick growth, early maturity, and the propensity for storing in their carcasses large quantities of fat with rather simple systems of feeding. No marked differences that are distinctively breed characteristics exist among market grades. There are as great differences within the breeds as among the breeds.

Purebred lines are maintained by strict adherence to purity of blood lines as indicated by pedigree and registration.

Breeding for type (Fig. 36) and efficiency involves the same general practices in all breeds, and is dependent upon known performances and wise mating of sires and dams that possess the form and qualities the breeder desires to perpetuate and improve. In attempting to improve swine the breeder must keep production costs in mind. These costs can be lowered only by increasing efficiency or reducing losses.

The choice of breed is largely a matter of personal preference, color, and type frequently being the dominating influences. It is generally wise, however, to choose that breed most common to the neighborhood. After the breed has been selected, the important matter of selecting individual sows and boars for the breeding herd is to be considered. (Fig. 37.) There may be advantages in making selections from localities beyond the immediate neighborhood in order to get new blood with which later to supply demand from near-by breeders. Any factors involved in the selection of individuals for a new herd apply equally to the selection of additions and replacements.

The purity of blood lines and the systems of breeding that have developed the individuals under consideration are determined from pedigrees. The physical merits of the individual animal, however, may be judged by several means. The most dependable are: (1) A critical examination of the animal and an inspection of other members of the litter, the sire, dam, and other closely related hogs; (2) the numbers, uniformity in size, and type of pigs in the litters; and (3) the regularity of farrowing by the dam and granddam.

Forming a breeding herd with sows from unrelated dams and sires, if otherwise equally good, is preferable to selecting sows from those closely related. Subsequent breeding practices thus will allow wider range of selection and greater opportunities for matings within the herd.

Sows and boars are probably more desirable if selected on the basis of weight attained at a given age under similar systems of feeding, as this factor indicates the rate of gain that may be expected in the offspring. Number of pigs in litters, uniformity of litter size, and percentage of pigs weaned and fattened are also important from the standpoint of low production costs.

163050°—33——17

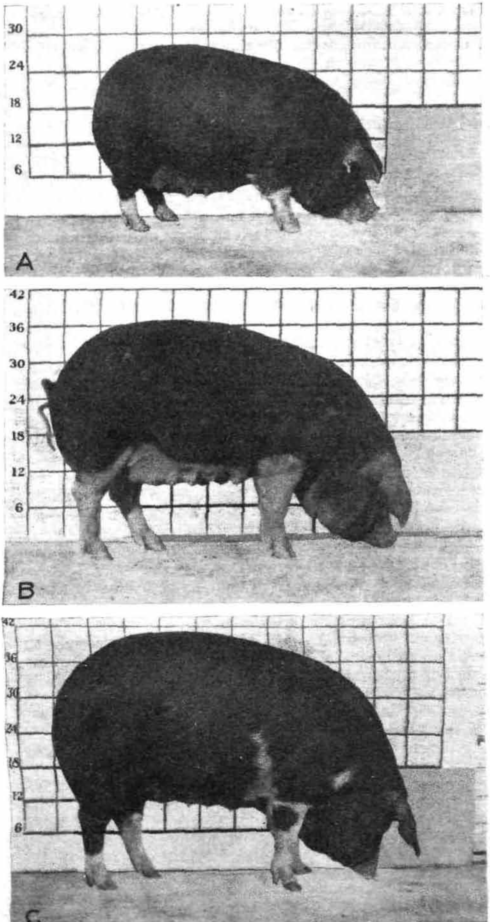


FIGURE 36.—Comparison of types of Poland China sows: A, Small type, weight 275 pounds at 1 year, 249 days; B, intermediate type, weight 473 pounds at 1 year, 255 days; C, big type, weight 474 pounds at 1 year, 256 days

To the foregoing factors, whose merits are commonly recognized, may be added birth weight. Recent investigations by the department have shown that whatever may be the factors responsible for variations in birth weight, they persist throughout the pig's lifetime. Table 7, based on data of 1,429 pigs, shows that heavy birth weights are associated with rapid gains, which are desirable in finishing pigs for market profitably.

TABLE 7.—*Gains and final weights, in pounds, of pigs classified by birth weight*

Average birth weight	Average daily gain to 70 days	Average weight at 70 days	Average daily gain from 70 to 190 days	Final weight at 190 days
1.5	0.375	28.1	1.18	170
1.75	.445	32.9	1.20	177
2.0	.465	34.5	1.23	182
2.25	.504	37.2	1.27	190
2.5	.522	38.9	1.32	197
2.75	.519	39.3	1.32	198
3.0	.556	41.9	1.35	204
3.25	.559	42.4	1.36	205
3.5	.618	46.8	1.43	219
3.75	.651	49.3	1.43	220
4.0	.629	48.0	1.44	221

The data show that for each 1-pound variation in birth weight there is a corresponding variation of approximately 0.1 pound in the average

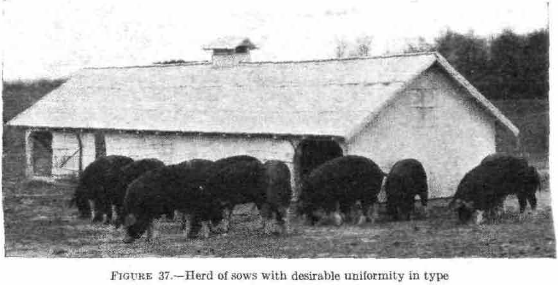


FIGURE 37.—Herd of sows with desirable uniformity in type

daily gain up to 190 days of age. However, as previously stated, the number of pigs per litter also should be considered in selecting breeding animals.

The number of pigs in a litter may range from 1 to 18 or more. An examination of 832 litters showed that 22 per cent had fewer than 7 pigs per litter, 66 per cent had litters of 7 to 12 pigs inclusive, and 12 per cent had more than 12 pigs. The birth weights of these pigs ranged from an average of 1.5 pounds to 3.95 pounds. Among these pigs were 4 litters of 16 pigs each, averaging 2.26 pounds, and 21 litters of 3 pigs each, averaging 3.08 pounds. The average birth weight of all pigs was 2.7 pounds.

In general, sows whose dams, sires, and other ancestors possess records of large numbers of pigs and of large pigs in litters, should be

selected. When the number of pigs farrowed per litter is consistently large, the cost of herd maintenance is considerably reduced because fewer sows are required.

Teat numbers and placement in breeding animals have not received as much consideration in the selection of breeding stock for the swine herd, as their importance justifies. Large litters, obviously, can not be suckled unless sows possess enough teats to nurse them. Possession of from 12 to 14 well-placed teats is a good standard for selection.

Certain abnormalities in breeding stock may be merely blemishes of no consequence, but some anatomical defects should cause all pigs of a litter to be rejected as breeding animals. Inguinal or scrotal hernias (ruptures into the scrotum) have been definitely proved an inherited defect. Ruptures about the navel are not associated with ruptures into the scrotum and have not been definitely determined to be of inherited origin. However, prudence demands that the occurrence of these ruptures in any pig of a litter should bar the litter mates from consideration for the breeding herd.

The ridgeling characteristic, that of retaining one or both testicles in the belly, is probably an inherited condition in most cases. Available evidence indicates that the mode of inheritance is not simple and that there may be some ridgeling cases not due to inheritance. Both boars and sows, though apparently normal, may transmit the ridgeling character. The defect may be materially increased by continued close breeding even without selection. Most double ridgelings are sterile, although there are authentic cases of fertile double-ridgeling sires. Most single-ridgeling boars are fertile. The only certain method of eliminating the defect is to refrain from using breeding stock from any mating that has produced ridgeling offspring.

Swirls, whorls, or unsymmetrical placing of hair in the skin, are not desirable among show animals and are usually regarded as disqualifications by swine breeders. Individuals which have such swirls should not be used as breeding stock in purebred herds, and breeding animals which have produced swirled offspring should be eliminated from registered purebred breeding herds.

Until more data have been accumulated in the measurement of performance in swine, the accepted practices of selection for popular types are advised. The type which yields the greatest percentage of the highest-priced cuts should find greatest favor. Little progress need be expected from pronounced modifications in type, unless the changed types are rewarded with more favorable market prices.

Feeding efficiency, or the capacity to convert feed into the greatest number of pounds of carcass, is obtained by selecting sires and dams singled out in performance tests and by closer attention to the details of management and feeding. (Fig. 38.)

Breeding animals are the sources from which the marketable product is obtained. It is only reasonable that, as such, they must be kept in full vigor through proper feed, management, and exercise. At all times feeds should be adequate for the particular requirements between breeding seasons, when carrying the young, and while suckling them. To produce strong, vigorous litters it is important to have both sire and dam in prime physical condition at breeding. Sows that are undernourished at breeding and during pregnancy, as shown by failure to gain in weight, seldom produce satisfactory litters. Examination of ovaries and embryos in slaughtered sows which had been bred some days prior to slaughter showed rather heavy percentages of resorptions

of the developing young. Resorption of fetuses continues under some circumstances until near the completion of pregnancy. The sow should be so well nourished with complete rations, including minerals, that even with vigorous daily exercise she will make an average increase in weight of about ¾ to 1 pound daily for the pregnancy period of 114 days. There is special need of an abundant supply of good water and comfortable, dry quarters for sleep and rest. Though seemingly obvious, these requirements are frequently neglected.

Data from records of sows between 1 year and 6½ years of age at time of farrowing show the advantage in culling the herd carefully after sows have reached 3 to 3½ years of age, retaining only those which possess some outstanding quality. In addition to the fact that sows begin to decline in efficiency after the age of 3 to 3½ years, there are decided advantages in having a sow herd uniform in age and size. Convenience in management and economy in housing space are among these advantages. Furthermore, older sows, when sold, are likely to bring lower prices.

FIGURE 38.—A 24-pen house at the United States Animal Husbandry Experiment Farm, Beltsville, Md., used in the study of feeding efficiency of different families and strains of hogs. Selections based on breeding, feeding, and carcass records are used in work on swine improvement

Ton-litter accomplishments, namely, the production of litters which reach 2,000 pounds live weight at 180 days, did not result from either special breeding or special feeding practices. They developed through the careful application of known facts of selection, feeding, and management. Intelligent discarding of inefficient individuals, families, or strains of hogs tends to result in the production of profitable herds.

Growing and Fattening Pigs

Death losses of young pigs from accident, exposure, and various preventable causes are needlessly high, and all reasonable efforts should be made to reduce them. Guard rails in farrowing pens, suitable protection from storms, and attention to sanitation are especially important. During the suckling period sows and pigs should have dry, well-bedded quarters. Since the profitable pig is one that never stops growing from farrowing to marketing, attention to adequate and suitable feed is essential for best returns. Such feed should include part of the pasture crops of the farm as well as grain and the usual supplements.

A 3-year experiment with both fall and spring pigs showed the value of self-feeders for sows and pigs during the suckling periods. In comparison with hand-fed lots, sows and pigs having access to self-feeders made better gains and the self-feeding method saved feed.

As a regular procedure in the production of market hogs, pigs should be castrated while still suckling their dams, so that plenty of time will be allowed for the wounds to heal thoroughly before weaning. Though pigs are commonly weaned at any age from 5 to 12 weeks and even older, experience indicates that in general they should not be weaned until they are at least 10 weeks old. To wean pigs earlier is likely to cause a set-back in growth and possibly a stunted condition.

After the pigs are weaned they should have good pasture and the same ration to which they had previously been accustomed. A suitable standard ration includes corn, a protein feed, and a mineral mixture. Any changes in feed should be gradual. Pastures for hogs are valuable and should be utilized as much as possible. But regardless of the quality of pastures, they need to be supplemented with grain to best results. As a hog grows and fattens it requires more feed per unit of gain; this makes gains in weight more and more expensive. In the effort to produce a well-finished hog it is possible to go too far, with consequent excessive feed costs, as well as to produce hogs that are too fat. However, if feed is cheap in relation to the price likely to be obtained for hogs, so that there is a prospect of profit from further feeding, a producer may market hogs at a somewhat extreme weight and degree of finish.

Associated with increased fatness is a decrease in the proportion of the inedible part of the carcass. A higher degree of firmness also normally accompanies increased fatness. The cuts from underfinished hogs are not so well suited for curing as are those from well-finished hogs. This is particularly true when the cured meat is to be stored for some time before it is used.

The relative effects of limited and full feeding should be taken into account in considering fatness or finish, especially in view of the public demand for less fat in meat. Restricted rations tend to produce leaner pork at a given live weight of hog than do unrestricted rations.

The relative palatability of meat from hogs of different degrees of fatness is a matter of widespread interest. A large portion of the public has been demanding meat containing little fat. On the other hand, many persons believe that palatability improves with increased fatness of meat, at least up to a certain point. The preponderance of evidence, thus far, seems to be on the side of the latter group. It remains to be determined, however, at what exact stage of fatness pork is most palatable to the greatest number of people.

Market Classes and Grades of Hogs

Hogs show wide variations in such characteristics as type, sex, age, weight, conformation, finish, and quality. These variations, together with increasing exactness in consumer demand for pork products, make it necessary, if the hogs are to be marketed economically, to segregate them into various market groups, such as classes, subclasses, use, age and weight selections, and, finally, grades.

Five classes of slaughter hogs are commonly recognized: (1) Barrows, (2) gilts, (3) sows, (4) stags, and (5) boars. Although constituting two distinct classes, barrows and gilts usually sell in a single group. Incidentally this group comprises the bulk of the hogs marketed. Pigs comprise the younger animals of the swine species and constitute a separate group. Pigs are subject to some of the same segregations as hogs.

Many systems of grading both slaughter hogs and pigs are used in the United States. The need for uniformity through the adoption of a single system is, however, becoming rather widely recognized. Such uniformity, of course, is possible only through the development and acceptance of a single set of standards for each of the market groups.

The Bureau of Agricultural Economics, several years ago, developed a set of standards which recognized three types and six grades of slaughter hogs. More recently the packing industry, partly because of changes in consumer demand, felt it desirable to encourage increased production of a type of hog which it chose to designate as "meat type." The objective of this movement is to produce a finished hog which carries a relatively large percentage of lean cuts and no excess of fat. The hog must, however, produce a firm carcass and show a reasonably high dressing yield. (Figs. 39 and 40.)

FIGURE 39.—Hogs from which winning carcasses were obtained in sweepstakes 10-barrow class, International Livestock Exposition, Chicago, 1931. These illustrate desirable type of market hogs

In an effort to be of the utmost service to the industry, in July 1931, the Bureau of Agricultural Economics cooperated with the Institute of American Meat Packers and the National Livestock Marketing Association in a revision of the bureau's standards. This revision consisted chiefly in a tentative recognition of the so-called "meat type" hog and a reduction of the number of grades from six to four. The first, or choice grade, really includes two grades designated as "meat type" and "fat type" hogs. The other grades are good, medium, and cull.

Descriptions of these tentative grade standards and supplementary information may be obtained from the Bureau of Agricultural Economics. The practicability of these tentative standards will be determined through their use on public markets and elsewhere, and through various tests which the department and the industry are making.

Dressing and Cutting Yields

It is clear that successful swine husbandry necessarily involves a practical knowledge of market requirements, as well as skill in hog-raising operations. In recent years the department has received large

numbers of inquiries from swine growers and others about meat yields of hogs of different weights and degrees of finish, and also requests for special information on the various characteristics of pork and lard. In view of the evident interest in these subjects, on which little published information is available, a summary of the more essential facts is here presented. Table 8 gives the dressing percentages of 5,227 hogs ranging in weight from 40 to 400 pounds. Barrows and gilts were about equally represented and most of the hogs were typical market animals.

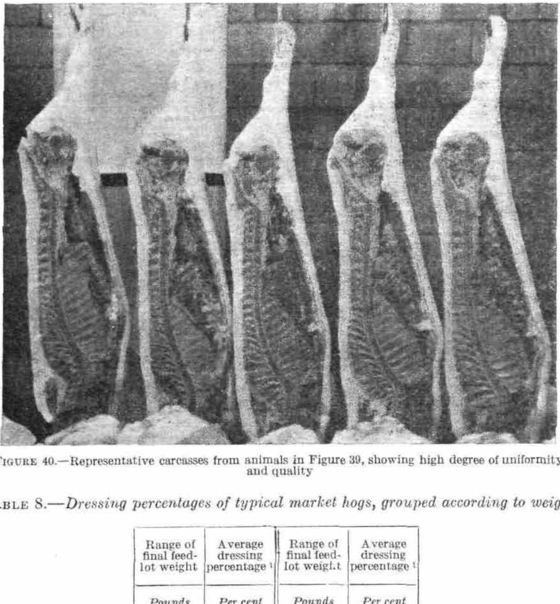


FIGURE 40.—Representative carcasses from animals in Figure 39, showing high degree of uniformity and quality

TABLE 8.—*Dressing percentages of typical market hogs, grouped according to weight*

Range of final feed-lot weight	Average dressing percentage [1]	Range of final feed-lot weight	Average dressing percentage [1]
Pounds	*Per cent*	*Pounds*	*Per cent*
40– 79	66.8	240–279	77.7
80–119	69.3	280–319	79.0
120–159	74.4	320–359	79.6
160–199	75.9	360–399	80.2
200–239	77.2		

[1] Obtained by dividing the chilled carcass weight, including head and leaf fat, by the final feed-lot weight

The table shows noticeably greater dressing percentages for the heavier hogs. This point is important, from a business standpoint, since a difference of 1 point in dressing percentage, for example, amounts to 2 pounds in weight of carcass of a 200-pound hog. Such a difference, though seemingly small, quickly runs into large amounts of dressed pork when many hogs are involved. Packer buyers often develop a high degree of accuracy in estimating dressing percentages.

Factors commonly regarded as influencing dressing percentage are live weight, finish or condition, "fill" or contents of stomach and intestines, type, and sex. Generally speaking, heavier weight, higher degree of finish, and smaller amount of fill are associated with higher dressing percentage. Normally, among hogs of the same live weight, those of larger type have a slightly lower dressing percentage than those of smaller type. Also, barrows tend to dress slightly higher than gilts.

Live weight is probably the most practical single index of dressing percentage when dealing with the general run of market barrows and gilts which are grown and fattened by the usual methods of feeding.

In using information from Table 8 as a guide the reader should bear in mind that the dressing percentage for a particular animal may be above or below that shown, owing to the influence of other factors. For example, a hog which for any reason is very fat at 180 pounds weight, may reasonably be expected to dress more than 75.9 per cent.

Of definite interest also is the yield of the various cuts from carcasses of different weights and fatness. Table 9 shows the average percentages of the more important cuts from typical hogs of three weights and corresponding degrees of finish, ranging from pigs to heavy hogs. Each weight group consisted of approximately equal numbers of barrows and gilts. The data are from the meat laboratory, United States Animal Husbandry Experiment Farm, Beltsville, Md.

TABLE 9.—*Average yields of the more important cuts from typical hogs of three different weights and corresponding degrees of finish*

Hogs	Average cold-carcass weight	Proportion of weight of important cuts to carcass					
		Skinned back fat, leaf fat, and fat trimmings	Belly	Shoulder	Ham	Loin	Head
Number	*Pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
26	77.8	10.9	9.4	18.5	19.9	13.2	10.7
188	146.0	17.0	10.8	17.4	18.3	12.0	9.4
92	238.7	21.5	11.9	16.7	17.0	11.0	8.5

As carcass weight increased from about 78 to 239 pounds the percentage of fat represented by the combined skinned back fat, leaf fat, and fat trimmings was approximately doubled. The percentage of belly increased slightly more than one-fourth, while ham, loin, shoulder, and head decreased. Head decreased proportionately the most, ham and loin an intermediate amount, and shoulder the least.

Soft Pork a Perplexing Problem

A condition commonly referred to as soft pork is one of the most perplexing problems with which the swine and meat industries have had to contend in recent years. Soft pork will not become firm even when thoroughly chilled at the usual temperature of 32°–38° F. Such pork is discriminated against in commercial channels, and packers who have built up a trade for products made from firm hogs dislike to handle soft hogs.

There are various degrees of softness; the medium soft, soft, and particularly the oily grades are all unattractive and, on account of their flabby, greasy, shapeless condition, are difficult to cut and handle.

Unfortunately, it is impossible to determine, before slaughter and chilling, whether a hog will be hard or soft.

Certain feeds are the most important cause of soft pork. As a class they are the feeds that contain relatively large percentages of fats or oils that have low melting points. In the United States it is probable that soybeans are responsible for more soft pork than any other feed. Other more or less common feeds that tend to make pork soft are peanuts, rice polish, rice bran, and mast. Feeds conducive to firmness in pork include corn, wheat, brewers' rice, soybean meal, and cottonseed meal.

Immaturity or lack of finish is another, though secondary cause of soft pork. Investigations by the department and cooperating State experiment stations have shown that up to about 125 pounds live weight, intermediate-type pigs that had been fed on rations of corn with nonsoftening supplements produced soft or medium-soft carcasses. Strictly hard carcasses were not produced until the pigs reached a live weight of about 180 pounds. Firmness and finish were closely related.

Studies conducted by the department in cooperation with the agricultural experiment stations of North Carolina and Virginia showed that differences in firmness of pork did not affect the desirability of the flavor or aroma of the roasted fresh meat. Corn and peanuts were the basal fattening feeds used in the study.

Pork and Lard in the Diet

Data on the general place of pork in the diet—a consideration that underlies hog production—are furnished in Table 10.

TABLE 10.—*Average annual per capita consumption of pork in the United States and proportion of pork to all meat consumed, by decades, 1902–1931*

Period	Pork consumed per person	Proportion of pork to all meat consumed
	Pounds	*Per cent*
1902–1911	61.1	41.7
1912–1921	59.0	45.0
1922–1931	70.8	50.0

Similar data for beef show a decrease in per capita consumption and also in the percentage of beef consumed in proportion to total meat. These decreases correspond very closely to the increases in pork consumption. Thus beef and pork may be considered as having practically exchanged places in the American diet in the last 30 years.

The popularity of pork products has a sound basis from a scientific standpoint. Investigations have shown, for example, that meat proteins when eaten with cereal proteins enhance the nutritive value of the latter. Thus the protein in the bread of a ham sandwich becomes more nutritious when eaten in combination with the meat.

The composition of cuts from different parts of the carcass varies widely. Boiled ham, for instance, is relatively high in protein, whereas typical salt pork contains little protein but is very rich in fat. These variations enable the skillful cook to serve pork dishes of equal value to the laborer or to the office worker.

The physical and chemical properties of pork make it especially suited to curing and smoking. At least 65 per cent of pork cuts are

normally sold as cured products. In addition, large numbers of hogs are slaughtered on farms and to a large extent the meat is preserved by curing. As previously indicated, the quantity of lard produced is influenced by the weight or degree of finish of the hogs, the nature of the ration, and other factors.

The trend in consumption of lard is of distinct interest. It is the impression of many persons that, for a number of years, the average American has been consuming less and less lard, with lard substitutes taking its place. On the contrary, an increase has occurred. During the decade 1902–1911, the average per capita consumption of lard in the United States was 11.8 pounds; in 1912–1921 it was 12.3 pounds; and in 1922–1931, 14.3 pounds. The figures represent an increase of approximately 20 per cent from the first to third decade. It is well known, however, that lard has had very strong competition from lard substitutes. Despite the increase shown, this competition probably has tended to hold down the consumption and to have an unfavorable influence on the price of lard.

There are several kinds of lard, the differences resulting from the nature of the fats used, the method of rendering, and methods of handling or processing after rendering. The principal commercial classification of lard is based essentially upon methods of rendering. This recognizes three classes, namely, prime steam rendered, kettle rendered, and neutral lard. A very large proportion of the lard sold in the United States is prime steam rendered. Kettle rendering commercially is a development from the method, long used on farms, under which a large iron kettle and an open fire are employed. Neutral lard is rendered at low temperatures and for the most part is made from leaf fat. It is neutral in flavor and widely used in the manufacture of margarine and in baking.

Shortening power is a valuable characteristic of cooking fat and varies considerably. A number of comparative studies by different research agencies have shown lard to be high in shortening power, as compared with other fats. From the nutritive point of view lard is essentially a highly efficient source of energy. However, recent investigations have shown that certain unsaturated fatty acids are necessary for normal nutrition and that lard is an excellent source of these essential constituents.[8]

Plastic range—the range of temperature at which a cooking fat is modable or workable—is another consideration of distinct practical importance. It is extensively believed that lards have a wider plastic range than do competing substitutes.

The desirability of the flavor imparted by lard to foods containing it and cooked in it, is subject to some difference of opinion. Many persons regard this flavoring quality of lard as one of its distinct advantages.

Rancidity is likely to develop in lard under unfavorable conditions. Well-prepared lard properly stored will usually remain in good condition for a long time. The absence of air, light, and moisture and the use of glass instead of metal containers, together with low temperature, contribute to keeping quality.

S. S. Buckley *and* O. G. Hankins,
Bureau of Animal Industry.

---

[8] Burr, G. O., and Burr, M. M. A New Deficiency Disease Produced by the Rigid Exclusion of Fat from the Diet. Jour. Biol. Chem. 82: 345. 1929.

SHEEP Raising in U. S. Has Changed Greatly Since Pioneer Period Sheep raising has always been one of the world's leading pioneer enterprises. In the past, sheep kept primarily for wool production have been raised cheaply in regions remote from civilization. Their herding instinct made it possible to handle them in large bands and wool could be transported long distances to market. The pioneer phase of sheep husbandry in the United States has largely disappeared. But the factors mentioned, combined with other characteristics of sheep, have made it possible to keep these animals in arid regions that otherwise would not be utilized. Prominent among the qualities that enable sheep to thrive in such regions are their adaptability to various climatic conditions, their ability to go days or even weeks without water when on succulent feed, and their fondness for shrub and weed types of forage not consumed by most other domestic animals. Consequently the sheep industry is well developed in the more arid sections of the West, in the rugged range territory adjacent to and including national forests, and in the fenced range area in southwestern Texas.

Sheep are also raised extensively in the grass-producing areas of the Eastern and Central States, particularly in rolling and hilly sections. Since sheep are fond of a great variety of weeds and underbrush which cattle and horses do not relish, they are useful in keeping fields and fence corners clean and in utilizing forage not so well adapted to other livestock.

To understand the influences that have contributed to the development of sheep raising in the United States and that underlie the success of plans for the future, it is desirable to consider competition from other countries.

More than two-thirds of the sheep in the world are concentrated in 10 countries. Australia has the most, Russia is second, and the United States third. On the basis of the number of sheep per square mile and also per hundred inhabitants, the United States ranks eighth. Thus, in spite of the large numbers of sheep in this country, the industry is relatively less prominent than in such other countries as New Zealand, Australia, Argentina, Uruguay, South Africa, the British Isles, and the Mediterranean region. There are in the United States, however, several areas where the concentration of sheep is dense. These are the fine-wool section of Ohio, portions of the intermountain region, particularly Utah and Idaho, and the Edwards Plateau of southwestern Texas.

Since sheep were introduced into Virginia in 1609, the demand has changed from wool to mutton and lamb. Sheep were important to the colonies of the North as a source of clothing material. The wool was usually worked up by the family that owned the sheep. There was little demand for mutton except as meat for the family. In the South, cotton took the place of wool to a considerable extent. In the North, sheep were so important that colonial governments did much to encourage their raising.

Early in the nineteenth century there were numerous woolen mills, and by 1840 the sheep in the United States numbered about 19,000,000. At that time the sheep production centered largely in Vermont. Production then moved westward and by 1850 Ohio was the leading sheep-raising State. As the westward movement continued, sheep were being raised in both Texas and California as early as 1860.

The Civil War first increased the price of wool and stimulated the industry, but the end of the war brought a crisis in the form of an oversupply of woolen goods and an influx of foreign wools. After 1870 there was rapid expansion of sheep raising in the far West, which continued until the range country was overcrowded. Range sheep reached a maximum about 1884, after which the number decreased, partly because of the deterioration of the range from overstocking.

By 1900 sheep raising in the East was largely confined to areas where, because of rough land or soil conditions, most of the farm was kept in pasture. Since that time sheep husbandry has been subject to severe competition throughout the United States. In the East dairying has continued to make inroads on the industry, and in those sections of the West where dry farming is important, cattle have largely replaced sheep.

During the World War the demand for wool for military uses resulted in increased prices for sheep and their products, but following the war there was a sharp decrease. Sheep raising again became relatively prosperous from 1923 until the world-wide depression caused prices to drop sharply in 1930 and still further in 1931 and 1932.

The number of sheep on farms and ranges at present is approximately 50,000,000. Texas leads with about 6,000,000, followed by Montana, California, Wyoming, Colorado, Utah, New Mexico, Oregon, Idaho, and Ohio. These 10 States possess about two-thirds of all the sheep in the United States.

Improved Types and Breeds of Sheep

The early demand for fine wool encouraged the development of Merino sheep in the United States. New England became famous for the heavy-shearing, wrinkled type. But by the close of the nineteenth century, along with the increase in population, a good demand for mutton had developed. Wool was then being produced at less expense on western ranges, and the East attempted to meet this western competition by producing more mutton. However, the building of transportation facilities throughout the country and the continued demand for mutton encouraged the development of a mutton type of sheep in the western range country as well as in the farm States. Even fine-wool breeders are now striving for mutton development in the Merino and Rambouillet breeds. Wool remains important, but lamb and mutton are now yielding more of the returns than wool.

Of all the registered purebred sheep enumerated by breeds in the United States census of 1930, those of the fine-wool type made up about 41 per cent and those of the medium-wool type 55 per cent; the remaining 4 per cent were of the long-wool type.

The 12 Western States (Texas, 8 Mountain States, and 3 Pacific States) had about 74 per cent of all the registered purebred sheep of the fine-wool type, 79 per cent of the long-wool type, and 38 per cent of the medium-wool type.

Of all the registered purebred sheep in the United States, Rambouillets were most numerous, followed by Hampshires, Shropshires, Merinos, Oxfords, Southdowns, Lincolns, Cotswolds, Corriedales, Dorsets, Cheviots, Romney Marsh, and Suffolks. Hampshires were especially numerous in the 12 Western States. Shropshires prevailed in the northeastern part of the country. Merinos were most important in Ohio and Texas. Oxfords led in the East North Central States and

Iowa. Southdowns were most numerous in Kentucky, Tennessee, and West Virginia. Lincoln and Cotswold sheep were most prominent in Oregon. Corriedales were decidedly most numerous in Wyoming. Dorset sheep were grouped largely in Ohio, West Virginia, Pennsylvania, New York, and Vermont. The remaining breeds had rather a varied distribution, Cheviots being most numerous in the Northeast, Romney Marsh on the Pacific coast, and Suffolks in the West.

The utility of sheep depends greatly on the selection of breed and type. In regions where range forage is sufficiently abundant to produce finished market lambs, Rambouillet and Merino ewes have been bred to Lincoln and other long-wool rams for the production of lambs that mature for the market at an earlier age and that have a more pronounced mutton form than do the average fine-wool lambs. Moreover, the Lincoln-Rambouillet crossbreds and similar crosses yield heavy fleeces of comparatively light-shrinking wool. This wool is of medium fineness and sells to advantage. During the last 20 years a great deal has been done toward the establishment of this type. Work of this nature conducted by the United States Sheep Experiment Station at Dubois, Idaho, has resulted in the development of what is known as the Columbia. This has been accomplished by mating Rambouillet ewes with long-wool rams, principally Lincolns, and interbreeding the resulting crossbreds.

The Corriedale, a similar type of crossbred, which was developed in New Zealand largely by crossing Lincoln rams and Merino ewes, is now considered an established breed. Since 1914 some choice Corriedales have been imported into the United States for use on western ranges. Another similar type known as the Panama, founded by crossing Lincoln ewes and Rambouillet rams, has been developed in south-central Idaho during the last two decades. During this time the Romeldale has been developed in California from a foundation of Romney Marsh-Rambouillet crossbreds. Hampshire rams have been extensively bred to crossbred and fine-wool range ewes, especially in regions having an abundance of forage. Lambs sired by Hampshire rams mature early and sell exceedingly well on the slaughter market. For this same purpose Suffolk rams have been used considerably during the last decade.

Karakul sheep were introduced from central Asia two decades ago for the production of fancy furs in the form of lambskins. They are few in number, being mostly in Texas, Colorado, South Dakota, Wisconsin, Michigan, and New York. However, they seem to be adapted to a wide range of conditions, and high-grade Karakul lambskins are in good demand.

Management of Sheep on Farms

Sheep management in the United States is divided into three distinct systems: (1) Keeping small flocks on farms, (2) raising sheep in large bands to utilize extensive range areas, and (3) fattening range sheep on irrigated and Corn Belt farms.

Eastern farm flocks are most frequently found in the hilly and mountainous region where much of the land is too rough to farm and must be kept in pasture. In regions distant from large cities, sheep raising is frequently one of the major farm enterprises. In districts where dairying predominates, sheep are seldom kept except on farms having abundant pasture. In the level areas, where most of the land is tilled, farm flocks are rather infrequent.

Except where flocks are kept to produce purebred stock, special crops are seldom grown for the sheep, which are generally turned onto pasture as soon as the grass begins to grow in the spring and remain there until the crops have been harvested, when they are usually given the run of the fields to graze and to clean up the weeds, and remain there until snow falls. They are then carried through the winter on hay and some of the unsalable roughage, with little or no grain.

The sheep on farms are kept primarily for the production of lambs and are mostly of the mutton breeds. Most of the lambs are born early in the spring and are generally marketed from late in May to early in November, when their weight and finish approach the condition desired for slaughter lambs. There is a decided tendency to give the sheep insufficient care, with the result that many inferior lambs are produced. As such lambs usually must sell for considerably less than the better grades, they are generally unprofitable to their owners. Furthermore, as the market is usually congested in September and October, these lambs seriously affect the price of the better lambs that have been more carefully raised.

Management of Sheep on the Range

The western practice of keeping sheep in large bands was developed as a means of utilizing the vast areas of free grazing lands in the Plains and Mountain States. But with the taking up of the best grazing lands for farming purposes, many changes from the earlier nomadic system have occurred. Though practices differ with the locality, the system found most satisfactory is essentially as follows:

The range-sheep unit, or band, is usually composed of from 2,000 to 2,500 sheep. From lambing time until weaning, approximately 1,200 ewes with their lambs are kept together in a band. After the lambs are weaned two bands of ewes are combined for the breeding and winter-feeding period.

Sheep producers on the western ranges generally give a band into the care of one herder who, with his dogs, stays with the sheep day and night throughout the season. He is quartered in a wagon equipped for his needs, except during short periods when he is near headquarters, or in the summer when he takes his sheep to high mountains where his wagon can not follow. In this case he transfers his equipment to a tent. A camp tender, with a wagon and team or pack animals, attends to the herder's needs by supplying him with food and moving his camp as the sheep exhaust the grazing in one locality. One camp tender takes care of one or more herders, depending on the distance over which he must haul supplies and on the roughness of the country. In large organizations a range foreman usually is in charge of several bands on his particular allotment of range, whereas in smaller outfits of one or two bands the owner may take the place of both the camp tender and the range foreman. Additional help is required seasonally, especially during lambing and shearing.

An exception to this general method is found in some parts of the Southwest, particularly Texas, where sheep are kept in paddocks or pastures. Here the operators own or have long leases on nearly all the land, an arrangement which enables them to build fences and let the sheep graze undisturbed in these large pastures. They employ fence riders at all times and additional help during lambing, but on a year-around basis one man can attend to a much larger number of sheep in

pastures than he could under the herder system. The pasture system has the additional advantages that the sheep, when unmolested, follow their own inclination and make more complete utilization of feed.

Intelligent, obedient dogs, properly trained, are valuable aids to the herder in managing his sheep. However, untrained dogs are often found with sheep and are fully as bad as no dogs at all.

Under range conditions sheep can be raised most efficiently in reasonably large numbers. This necessitates control of sufficient land to provide grazing. Most range operators protect themselves in this respect by purchasing or leasing a substantial part of the necessary land or at least acquiring enough small holdings to control the watering places. In many instances it has been necessary to provide more watering places, to build warehouses for the storage of feed, and to develop these holdings in other ways. It is now necessary to own improved ranch property before one can obtain permission to use the national forests for grazing purposes. This investment in land and improvements has greatly increased the necessary capitalization.

Operating expenses have also increased. Crowded conditions make it necessary, except on the southern ranges, to provide considerable winter feed, the amount varying with the locality and with the season.

These increased operating expenses have made the production of wool alone generally less profitable than the production of both wool and lambs. Fortunately, the demand for mutton and lamb has made it possible for the range operators to change from a strictly wool-producing basis to that of producing both wool and meat. At present most range operators are giving more attention to the production of lambs than to production of wool. One step in meeting the higher operating expenses was the elimination of the numerous bands of wethers, which were kept primarily for their wool. The development of a type of ewe that would produce a good market lamb and a readily salable grade of wool, and at the same time maintain the herding instinct of the Merinos, was accomplished by breeding Rambouillet ewes to long-wool rams. In many cases this crossing with long-wool animals was carried to such a point that many of the ewes are losing their herding instincts. As it is difficult to keep the desirable characteristics of the first cross, various efforts have been made to obtain a fixed type of crossbred sheep.

In order to maintain the breeding stock it is generally necessary to replace about one-fourth of the flock each year. The early lamb raisers usually make this replacement by direct purchase, but most flockmasters save a sufficient number, about half of the ewe lambs, for this purpose. Under ordinary range conditions crossbred ewes must usually be discarded by their fifth year, whereas Rambouillets may be used from one to two years longer. The discarded ewes usually sell for about half their value at the time they entered the band. In spite of discarding aged ewes there is a considerable annual loss from ordinary causes and occasional additional losses from droughts or severe winter storms. In planning breeding operations, allowance should be made for losses of this character.

Fattening Lambs for Market

Fattening lambs for market is extensively followed in several sections of the Corn Belt and adjacent areas and in many irrigated districts. There are three general systems of finishing: (1) Fattening in

cornfields in the Corn Belt States, (2) open-yard feeding west of the Missouri River, and (3) fattening in barns in the East Central States.

The practice of fattening lambs by turning them into cornfields and allowing them to harvest the crop is followed in districts throughout the entire Corn Belt. It is, however, most common in Iowa and northeastern Nebraska, where it is the prevailing type of sheep finishing. Most of the lambs are purchased in central markets, Omaha and Chicago principally, in September and October, although some are taken in August. The lambs are usually given the run of the pastures and hayfields and allowed to clean up weeds and waste corners for a week or two. They are then turned into the cornfields, in which rape has usually been planted, and are allowed to harvest the crop. Most of them are sold in the latter part of November and in December. The lambs that are not fat enough are held over and fed ear corn on pasture or in dry lots, and shipped in January. This practice has the advantage of requiring but little labor and equipment, but the death rate is usually greater than in open-yard or barn feeding.

The practice of feeding in open yards prevails west of the Missouri River, where there is comparatively little stormy weather during the early part of the winter. The most extensive feeding district is in northeastern Colorado, where from 500,000 to 1,000,000 head are fed annually. Other extensive feeding districts are the Arkansas Valley in southeastern Colorado, and the Scotts Bluff district and along the Platte River in Buffalo, Hall, and Merrick Counties, in Nebraska. There are other small areas in Nebraska and Kansas including large commercial feed yards near public markets and also in the irrigated valleys of the far West.

The fattening of lambs is important in the beet-growing districts as it helps to provide a market for the large quantities of alfalfa that must be grown in the rotation system and also utilizes the beet tops. The sheep manure is highly prized in helping to maintain sugar-beet yields. As corn is grown to only a limited extent in these districts it is shipped in from Nebraska and Kansas. Barley, oats, and even wheat are fed also in the early stages of the fattening process. In Nebraska the lambs not only provide a market for alfalfa, but also utilize some of the surplus corn.

A large percentage of the lambs are fed in bands that range from 250 to 5,000 head. Some producers, however, operate on a much more extensive scale. These are usually large landholders who distribute their sheep in lots of from 5,000 to 10,000 on different farms. Most of the lambs are put in the yards in October and November. The northern range lambs usually weigh about 60 pounds and the southern lambs from 50 to 55 pounds, when delivered. They are fed for four or five months during which they gain from 25 to 30 pounds. It is generally figured that during the feeding process a lamb will consume about 250 pounds of hay and 150 pounds of corn or its equivalent. As the lambs do not finish evenly, it is usual, especially in the larger yards, to sort out the fat lambs from time to time and market them in several shipments. These shipments usually begin in February, the bulk of the lambs going in March and April; sometimes there are shipments as late as May. Some of the operators also handle a limited number of aged ewes and wethers.

In the East Central States, where there is much stormy weather in the late fall and winter, lambs are usually fed in barns. Barn feeding

is most extensive in northeastern Indiana, southern Michigan, parts of Illinois and Ohio, and, to a limited extent, in western New York. Although charges for labor and equipment are much higher than where the lambs are fattened in cornfields or in open yards, barn feeding furnishes gainful occupation for farmers during the winter months when ordinarily there is not much farm work. There is also much less risk as the sheep receive more attention. Most of the farmers handle only from 150 to 300 head and plan to obtain lambs that will finish evenly. Large numbers of lambs are also fattened in commercial feeding plants near the central markets of this region. Most of the lambs are purchased at Chicago. They are fed from four to five months and then shipped to Buffalo, Pittsburgh, or other eastern markets. As the cost of grain is higher than it is farther west, these eastern farmers find it difficult to compete with the Corn Belt and Colorado feeders. They feel, however, that they can afford to feed on a very close margin for the sake of the manure, which is much needed in maintaining soil fertility.

Shearing Sheep and Handling Wool

Sheep are sheared in the United States in the spring, usually between March and June inclusive, although in some parts of Texas and the Southwest they are again sheared in the early fall. Sheep should be sheared in a clean, dry place and, in order that the wool may be dry and pack well, it is considered a good plan to shut up the sheep the night before the shearing. This practice also permits the paunch and intestines to be evacuated and thereby makes the shearing operation more comfortable for the sheep. It also lessens their struggling, which in turn increases the speed of the shearer and makes possible a better job. For shearing large flocks of sheep mechanically driven clippers are best, both for speed and for uniformity of results, although a good job can be done with hand-power clippers. The general use of "blades" or hand sheep shears has practically been discontinued in this country.

There are many different methods of shearing a sheep. It is probably better for the shearer to use his own method, if it is giving satisfaction, than to learn a still better one, except possibly in the case of professional shearers or men who spend a large part of the spring in this work. However, the following points should be closely observed, regardless of the method used: The fleece should be kept intact; the cutting edge of the clippers should be close to the skin at all times in order to avoid second cuts; and the fleece should be kept dry and clean.

The department has received many requests for information on a good method of shearing sheep. The following practice, which is giving good results throughout the western part of the United States, is recommended:

Start shearing by clearing the brisket (fig. 41 A), then open the fleece by a downward stroke to the right rear flank. Clear the belly by making a number of strokes from right to left, beginning at the top and shearing lower and lower with each swath. Avoid clipping the ends of the ewe's teats when shearing wool from the lower part of the belly. Next shear the inner side of the hind legs. Turn the sheep on the right thigh, shear the wool from the front of the left hind leg, then shear a swath up the left leg almost to the loin. Breaking the fleece along this line, shear a number of swaths parallel to this and clear the left thigh and the dock. With the sheep still on its right thigh, open the fleece

along the left side of the neck from the brisket to a point near the ear. (Fig. 41 B.) After a few strokes along the neck shear the wool from the top of the head and down over the left shoulder. Next lay the sheep on its right side with the shearer's left foot under the sheep's right shoulder, and shear the wool from the left side by a number of strokes from the rear flank to the shoulder, beginning near the belly and work-

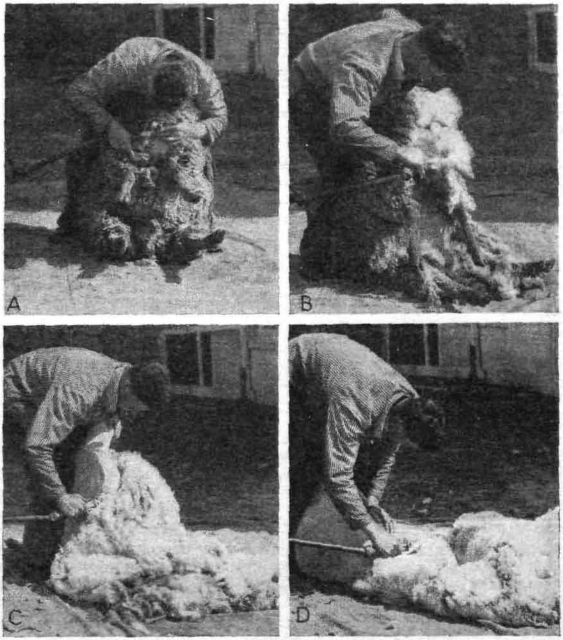


FIGURE 41.—Shearing sheep: A, clearing the brisket, the first step in shearing; B, opening the fleece along the left side of the neck; C, removing the wool from the right side of the sheep; D, shearing the right thigh, the last step in removing the fleece

ing over to a line near the backbone. (Fig. 41 C.) Then step across the sheep with the right foot, raise the sheep's head, and shear the wool from the right side of the neck.

To shear the wool from the right shoulder raise the sheep so that it rests on its left thigh. With a circular motion from a point near the backbone to the line at which the fleece was opened, clear the wool to a point slightly back of the shoulder blade. Then, with a diagonal stroke toward the rear right flank, remove the wool from the right side and well down on the thigh. Double the head back, as shown in Figure 41 D. Shear the wool from the lower part of the thigh and dock, thus completely removing the fleece from the sheep.

Before the fleece is rolled and tied it should be spread flesh side down, and all dung and heavy sweat locks should be removed. In roll-

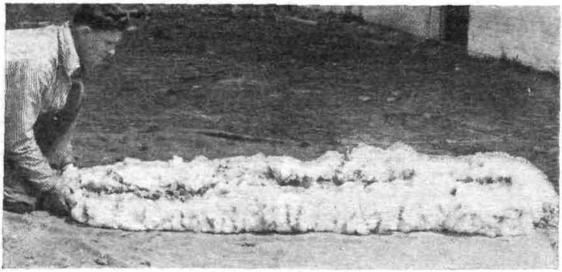


FIGURE 42.—Turning the edges of the fleece preparatory to rolling

ing the wool, turn in the edges of the fleece and turn back the head and neck wool. Beginning at the breech, as indicated in Figure 42, roll the wool toward the shoulder of the fleece. This leaves the shoulder wool in a prominent place when the fleece is tied. Only enough paper twine should be used in tying the fleece to keep it intact. Usually one strand of twine, wrapped once each way at right angles around the fleece, is sufficient. (Fig. 43.) Wool buyers prefer this method to that ordinarily used with wool boxes. After the fleece is sheared and tied, it should be stored in a clean, dry place, preferably in bags made especially for storing and shipping wool, until it is sent to market.

FIGURE 43.—A fleece properly rolled and tied with one strand of paper twine

Mutton and Lamb in the Diet

The number of sheep and lambs slaughtered annually in the United States is about 18,000,000; this number produces about 700,000,000 pounds of dressed meat, practically all of which is consumed within the United States. Per capita consumption of lamb and mutton is only a small fraction of

that of beef or pork, and there seems to be no good reason why it should not increase materially. In several other countries, notably Australia, the United Kingdom, Argentina, and France, lamb and mutton constitute a much more prominent part of the meat diet.

In the United States there are marked sectional differences in the popularity of lamb and mutton. Cooked lamb and mutton have a characteristic taste which, as in the case of other meats, is caused largely by the chemical composition of the meat fat. Eastern consumers, particularly, like this flavor.

Department and cooperating State experiment stations have found the meat of suckling lambs produced on good pasture to be as satisfactory, both in degree of finish and in palatability, as that from similar lambs which also received grain. They have also found that legs of lamb held in cold storage definitely improved in tenderness during the first 7 to 10 days. Storage for an additional 10 days caused but little further improvement in tenderness.

In recent years the meat trade has given much attention to popularizing cuts of lamb, many of which provide unusually attractive and appetizing dishes. Recent investigations by the department have disclosed various improved methods of preparing this meat for market and home use.

D. A. Spencer *and* C. G. Potts, *Bureau of Animal Industry.*

DAIRYING

CHANGING Dollar Value and Production Cycle Greatly Affect Dairying Great changes in prices during the last two decades have been the most important factors affecting the dairy industry; they have resulted in maladjustments and many unusual price relationships.

In 1932 the wholesale price of butter at New York was 56 per cent less than in 1928. The decline in butter prices in the three years 1930 to 1932 was the most violent in 100 years. The price of butter in 1932 was about one-third less than the pre-war average of 30.6 cents, whereas in 1920 it was double the pre-war average.

Somewhat similar changes occurred in the prices of other dairy products. The price of cheese in Wisconsin in 1920 was 201 per cent of the pre-war average, and in 1932, about 70 per cent. The price of evaporated milk was only 41 per cent as much in 1932 as in 1920.

The violent changes in prices of dairy products during the last 20 years have been due in large part to the changes in the value of the dollar. As the general level of all prices rises, the value of the dollar decreases; as the general level of prices declines, the value of the dollar increases. In 1920, the price of butter was double the pre-war price. However, the price of butter in relation to prices of other commodities—that is, the purchasing power of butter—was 11 per cent less than the pre-war price. During the 5-year period 1925–1929 the price of butter averaged 50 per cent above pre-war price, but in relation to other prices was only 5 per cent above pre-war price.

The Cycle in Prices

A second important factor affecting the dairy industry is the cycle in prices of dairy cattle and all cattle. This cycle is 14 to 16 years long, with short periods of high prices followed by long periods of low prices. (Fig. 44.) During the periods of low prices the purchasing power of the price of milk cows has been about one-half as great as in the periods of high prices. When prices of cows are high farmers raise too many heifers; when prices are low they raise too few. *Prices of pure-bred cattle fluctuate more violently than prices of all cattle, and prices of heifers fluctuate more than the prices of mature animals.* The last peak in cattle prices came in 1929, and the years 1930 to 1932 have been years of declining cattle prices.

During inflation and deflation commodity prices do not all change at the same time or by the same amount, and many unusual price relationships occur. During deflation, prices to producers fall more

rapidly than wholesale prices and wholesale prices fall more rapidly than retail prices. When prices rise the sequence is reversed; prices to producers rise the most, and retail prices the least.

In 1920, the retail price of butter in American cities was 93 per cent above pre-war price. The wholesale price was 101 per cent above that of the pre-war period, whereas the price paid to producers for butterfat was 113 per cent above pre-war level. In 1932 the price of butterfat to producers was 68 per cent of the pre-war price, the wholesale price was 68 per cent and the retail price, 76 per cent of the pre-war figure. The price of cheese in Wisconsin in 1932 averaged 69 per cent of the pre-war price, the wholesale price in New York was 85 per cent of that of pre-war time, and the retail prices in cities, 104 per cent of the pre-war amount.

Prices to producers fluctuate more violently than retail prices in times of inflation and deflation because freight rates and other distributive charges change slowly. These items make up a material part of

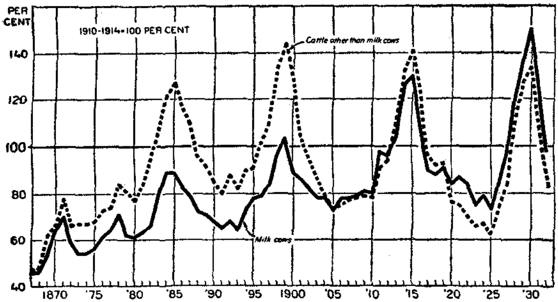


FIGURE 44.—Adjusted value per head of milk cows and cattle other than milk cows, 1867–1932

the retail price of dairy products, so that small changes in retail prices are accompanied by much larger changes in prices to producers.

In addition to the changes in relationships between farm, wholesale, and retail prices of dairy products, there have been marked changes in price relationships among different farm products. For the four years 1917 to 1920, the farm price of feed grains averaged 214 per cent of pre-war prices; during the same period the farm price of dairy products averaged 160 per cent that of pre-war times. During the war inflation, prices of grains rose earlier and farther than those of dairy products. (Fig. 45.) With prices of dairy products relatively low as compared with those of grain and feedstuffs, there was little expansion in dairy production. Total production of butter (farm and factory) was only 1.5 per cent larger in 1919 than in 1909, and this was the smallest increase between two census years since the census of dairy products was first taken in 1849.

The Deflation of 1920

Figure 45 shows that in the deflation of 1920, farm prices of grain and meat animals declined earlier and farther than those of dairy products. In the 10-year period 1921 to 1930, farm prices of feed grains averaged

116 per cent of pre-war prices, whereas those of dairy products averaged 138 per cent of pre-war prices. The decade 1920–1929 was a period of relatively high prices of dairy products as compared with those of grain, and there was a marked expansion in the dairy industry. Butter production (farm and factory) was 31 per cent greater in 1929 than in 1919, in marked contrast to the 1.5 per cent increase during the preceding decade.

With the price decline in the three years 1930–1932, changes in relationships have been much the same as those that occurred in the deflation of 1920–21. Prices of feed grains declined earlier and farther than those of dairy products. Even though farm prices of dairy products are unusually low they are relatively high when compared with those of grains and of many other farm products.

The rapid decline in prices of cattle and milk cows in relation to those of other commodities in the period 1915–1925 discouraged the raising of heifers, and in the decade 1921–1930 there was relatively

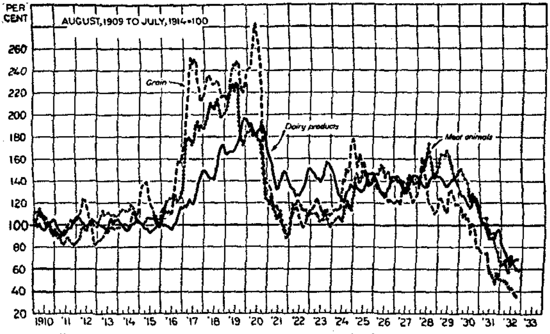


FIGURE 45.—Farm prices of dairy products, meat animals, and grain, 1910–1932

little change in milk-cow numbers in the country as a whole. The increase during this period amounted to only 0.4 per cent per year. During this same period the population in the United States increased at a rate of 1.4 per cent per year. The number of milk cows increased most rapidly in the Western States. In the North Central States, where the bulk of the manufactured dairy products is produced, the rate of increase in milk-cow numbers was decidedly greater than for the United States as a whole. In the South Central States numbers increased, but at a less rapid rate than in the North Central or Western States. In the North and South Atlantic States there was a downward trend in milk-cow numbers.

In contrast with the slight upward trend in milk-cow numbers in the decade 1920–1929, the 3-year period 1930–1932 has been a period of rapid increase in cow numbers. The increase was due primarily to the rapid increase in milk-cow prices in the period 1925–1930, and to high prices of dairy products as compared with those of other farm products. In 1931, the increase in cow numbers was the largest in over 30 years. This increase has been general in all parts of the country.

Distribution of Dairy Cattle

Although there was considerable geographic variation in the increase in milk-cow numbers during the last decade, about two-thirds of the milk cows are in the North Central and North Atlantic States. Milk cows are most numerous in the areas with cheap feed, natural pastures, near the large urban centers.

Although there was relatively little change in milk-cow numbers in the decade 1920–1929, there was an increase in milk production per cow, so that total milk production increased. Production of manufactured dairy products increased at the rate of 2.4 per cent per year, compared with a 1.4 per cent per year increase in population.

Although there was a rapid increase in dairy production during the postwar period, it was not exceptionally large when compared with increased production of other commodities; total industrial production in the United States increased at the rate of 3.6 per cent per year.

There is a wide variety of manufactured dairy products, but about 80 per cent of the whole milk used in production of manufactured dairy products was used for butter—creamery and farm butter combined. Cheese, next in importance, required about 8 per cent of the milk, evaporated milk required about 6 per cent, ice cream, 5 per cent, and condensed milk, 1 per cent. Powdered whole milk, powdered cream, and malted milk required less than 0.5 per cent of the milk.

It is estimated that in 1931 about 55 per cent of the 105,000,000,000 pounds of milk produced in the United States was used in factory production of dairy products and in the making of farm butter.

Although there was a marked upward trend in the total production of manufactured products in the decade 1921–1930, there was a good deal of variation among the products manufactured, reflecting differences in demand.

Total manufactured dairy production increased at the rate of 2.4 per cent per year. Of the principal products, ice cream, evaporated milk, and cheese show the largest rates of increase and increased faster than the total of all manufactured products. The rate of increase in butter production was somewhat less than the rate of increase for all products. The production of condensed case goods declined, largely as a result of the decrease in foreign demand.

Cheddar cheese is the most important type produced in the United States. In the period 1921–1930, cheddar-cheese production increased at the rate of 3.3 per cent per year. The production of cream and Neufchatel cheese and of Italian varieties increased rapidly, the rates of increase being 12.5 and 9.5 per cent per year, respectively. The general trend of Swiss, brick, and Munster production was downward.

Shift to Factory Butter

A striking development in the dairy industry in the period 1921–1930 was the shift in the production of butter from farm to factory. Total butter production increased at the rate of 2 per cent per year. Creamery-butter production increased at the rate of 4.3 per cent per year, but farm-butter production, as shown by the census, decreased about 2.9 per cent per year. In 1919, about 45 per cent of the total butter produced in the United States was farm butter; in 1929, only 25 per cent was farm butter. Very little farm butter is found on the larger markets, practically all being consumed locally.

Another marked development was the rapid increase in the manufacture of skim-milk products, indicating a more complete utilization of the by-products of the dairy industry. These increases in production have been particularly large for powdered skim milk and dried or powdered buttermilk, the rates of increase being approximately 20 per cent per year. The production of cottage, pot, and bakers cheese, dried casein, and milk sugar each increased at the rate of 10 per cent or more per year.

In the years 1929–1931 the upward trend in production of manufactured dairy products was not maintained. Production was somewhat less in 1932 than in 1931. The three years 1930–1932 were years of exceptionally poor pastures, which curtailed summer production. Feed supplies in 1930 and 1931 were relatively small. These factors, together with the low prices of dairy products, tended to curtail dairy production.

With the general price decline of the last three years, wages and pay rolls have been reduced. This reduction in consumer purchasing power has resulted in a drastic curtailment of consumer expenditures for dairy products. With the volume of dairy production being maintained in fairly large volume, retail prices of dairy products have declined about one-third since 1929 in order that the supply might be moved into consumption.

The general decline in prices has curtailed the demand for butter and cheese for storage. In the three years 1930–1932, which were years of declining prices, about 15 per cent of the butter produced in the months from May to August was moved into storage. In contrast, during the three years of rising prices, 1917–1919, about 28 per cent of the butter produced in the summer months was moved into storage. In the period of fairly stable prices, 1925–1929, the movement into storage in the summer period was 21 per cent of production.

In the period of rising prices, nearly one-half of the cheese produced during the summer months was moved into storage, as contrasted with about one-fifth during the period of declining prices.

Changes in Foreign Trade

Although at present the foreign trade of the United States in dairy products is small as compared with domestic consumption, marked shifts have taken place. Exports of butter and cheese reached a peak about 1880. But with the beginning of the present century the foreign trade of the United States shifted from a net-export to a net-import basis. This net-import basis has been maintained up to the present time except for temporary war-time revival of exports.

The excess of imports over exports reached a peak in 1926–27, when net imports were equivalent to about 1,250,000,000 pounds of milk or slightly more than 1 per cent of the total production in the United States. Since that date the volume of net importations has declined steadily.

Exports, first of cheese and then of butter, practically disappeared from the foreign trade of the United States. Exports, predominately of concentrated milk, amounting in 1919 to about 5 per cent of total production, fell off sharply with the cessation of the World War. Exports of concentrated milk continue, but have been greatly reduced.

In the import trade of the United States cheese continues to predominate. Imports of fresh milk and cream from Canada in 1926 and

1927 were equivalent to about 400,000,000 pounds of milk. The tariff act of 1930 increased the rates on milk and cream, and as a result milk and cream imports have fallen off rapidly, and are now unimportant.

Butter imports recently have been of very small volume and practically balanced by exports. It is significant that after the World War, when production in foreign countries was increasing more rapidly than recovery was being made in the purchasing power of European consumers, imports of butter into the United States reached a maximum of 37,000,000 pounds.

Although the foreign trade of the United States in dairy products has been small in recent years, foreign prices of butter and cheese have affected domestic prices. In relation to the present low prices of dairy products and present tariff levels, however, the ad valorem rate is unusually high.

E. W. GAUMNITZ, E. E. VIAL, *and* J. B. SHEPARD,
Bureau of Agricultural Economics.

BREEDING Better Dairy Cattle Facilitated by Studies in Genetics

Man was a breeder of domestic animals before the dawn of the iron age, and he has followed that vocation through all the succeeding stages of civilization. His creatures to-day are a vast improvement over the stock from which they sprang, but how does this development compare with that represented by the watch that marks time for him, the automobile that carries him on his daily errands, or the radio that entertains him during his leisure hours?

If all the dairy cows in the United States to-day were economical producers of milk and butterfat, no further improvement would be necessary and we could let well enough alone. But such is not the case. Even in our dairy herd-improvement associations, where the average production is well above that of the average for all milking cows in the United States, one-third of the cows on test fail to return enough to pay for their feed, one-third earn only their keep, and only one-third earn a profit over feed cost. There may have been a time in the early days of the automotive industry when only one-third of the cars were successful, but that day has long since passed. The airplane industry, if it had a like record of inefficiency, would have been ruined in its infancy. Yet this inefficiency continues in the business of dairy-cattle breeding.

Progress by Pioneer Breeders

It is to the everlasting credit of the pioneer breeders of livestock that they made measurable progress without the benefit of precise knowledge of the laws of heredity. They were keen observers, and their eye for cattle was their stock in trade. By careful selection they wrought improvement where scores of others failed. This ability has been variously referred to as intuition, keen insight, a gift, or a special endowment which came only to a select few. It was generally thought that without it no one could achieve permanent success, even though he tried to imitate the practices of the breed improvers. But at the beginning of the present century, the science of genetics was born with the resurrection of the published results of the experiments by Gregor Mendel.

The need of further knowledge about the laws of heredity has stimulated the efforts of investigators during the intervening years, with the result that it is now possible to apply the available information to developing a method of livestock breeding that will largely eliminate uncertainty and risk.

It is probable that the proportion of unprofitable dairy cows in the entire cow population is larger than one-third. But even if the ratio is no more than one in three, it is enough to throw a severe burden of loss on dairy farmers. About 5,000,000 heifers are raised each year to provide replacements for milking herds. According to the figures of the dairy-herd associations, one-third of these heifers, or 1,666,666, will fail to produce enough milk to pay for the feed they consume. They will be close to 3 years old, on the average, before this deficiency is disclosed, and by that time the cost of raising and keeping them will have *reached $100 or $150 each, depending on how they have been handled.* When the tester's scales reveal their lack of milk-producing ability, the butcher will buy them for $25 to $50 a head. The dairyman will write off a net loss of $75 to $100 on each, but he will rarely ask, "What about it?" Unfortunately, not enough of these bovine mortgage builders are detected and eliminated in their tender years. Too many are allowed to clutter up barns and poke their noses into mangers year after year, and in return they add their individually meager share to an already overabundant milk supply, which at times threatens to wash away all the profits of dairy farmers. Nor is that all, for the other 1,666,666 heifers that are expected merely to break even with the feed bill, must surely be gifted with beauty or sociability if they are allowed to linger in the barns, straddling the profit and loss line.

Staggering Loss From Poor Animals

For the present, we may be able to endure the profitless society of the 1,666,666 heifers that break even, but surely we must do something about the other 1,666,666 that drain the profits from the milk-producing business, causing a loss that amounts to the staggering total of $124,999,950 when we figure the cost of raising the heifers at $75 a head. Cold economics will finally force a quest for knowledge needed to overcome this loss.

Geneticists, like most other scientists, have set out to unveil the mysteries of nature. Much of the experimental breeding work which has been done is apparently far removed from the practical field of breeding better dairy cattle. Many of the investigations reported are carried on with plants, and many more with insects and small laboratory animals. After sifting, weighing, and studying a vast amount of information, observing men have uncovered certain facts about the working of the laws of heredity. Recording the breeding results obtained by crossing plants or animals that have contrasted characteristics, these men have gradually built up an understanding of how hereditary characteristics are transmitted from parent to offspring.

Many variations in hereditary characteristics, observed in every herd of cattle, are now easily explained. When Holstein was mated to Holstein everyone expected Holstein offspring, and they were not disappointed. But how many breeders asked why this was true? No one seemed greatly interested, it just had to be that way. It never occurred to a breeder that the get of Holsteins were Holsteins because

they inherited Holstein characteristics from their parents in accordance with the laws of heredity. But when black and white Holstein parents produced a red and white Holstein calf, then the breath of scandal touched this particular mating and the unfortunate calf was hustled into oblivion and even the breed association refused to give it a number, though its parents may have theretofore begat numerous orthodox progeny.

"Off-Color" Animals no Longer a Mystery

Genetics can explain this phenomenon and remove the stain of doubt from the parentage of this calf; but nobody can remove from the sire and dam the genetic taint that has come down to them in the germ plasm through numerous generations from some early foreign progenitor that was red and white. Even denying registration to off-colored animals since the founding of the Holstein-Friesian Association of America has not been effective in entirely eliminating this inherited trait. But the occasional appearance of the trait is no longer a mystery. Other facts regarding inheritance in cattle can be explained. Perhaps that part of genetic knowledge available for use as an aid to dairy-cattle breeders is meager in comparison with similar information in other fields, but it is evident that a constructive program can be formulated.

First of all, it is known that the ability to produce milk is a hereditary characteristic. In other words, this ability is transmitted from both parents to the offspring. The inheritance of this trait is not so simple as that of coat color, presence or absence of horns, or broken or solid color, but nevertheless, it follows the laws of heredity. Since the ability of the heifer is inherited from its parents, the wise breeder will develop his herd from analyzed parental stock. This means testing his animals for milk and butterfat production. In the case of females such records do not necessarily indicate their transmitting ability, but they offer a mark from which to measure progress of the succeeding generation. When a female has tested progeny, their records compared with her own give the best measure of her transmitting ability. As stated above, the milk-producing function is inherited from both parents. This is the breeder's good fortune, as it enables him to build up his herd rapidly by centering his attention on the selection of herd sires. Here is the key to assured breeding progress—the continuous use of sires having known transmitting ability. What they are transmitting has been determined by comparing the individual production records of six or more of their unselected daughters with the records of the dams of these daughters. Additional pairs of daughters and dams make the proof more dependable. The breeding-performance records of such sires will be repeated as long as they are used. Sires selected as herd improvers must have demonstrated their ability to beget daughters all or most of which produce more milk and butterfat than their dams produced under similar environmental conditions. Use of such sires assures a steady increase in the average production of the herd, and also largely eliminates the costly burden of raising heifers to be disposed of as culls. Such sires can be used with the certainty that more than one in three of their daughters will earn a profit and that far fewer than one in three will fail to pay for their feed.

Influence of the Proved Sire

The first cross of such a proved sire on an ordinary herd of dairy cows might be compared to pouring a glass of red ink into a glass of water. The result would be a pink mixture. Into the germ plasm of the herd this prepotent sire pours his better heritage for milk production and the result is that the new generation is genetically better than the older one. Use of the next sire would correspond to adding to the pink mixture another glass of red ink, which would deepen the color of the mixture. If the process were repeated the mixture would finally be so deeply colored as to pass for pure red ink. And so the contributions of these prepotent sires in sequence would gradually build up the inheritance for milk production in the herd until it is pure for a high and profitable level of production. This should be the aim of all forward-looking breeders, for herds bred in this pure-line fashion could then supply young herd sires that possessed the inheritance to transmit increased production. They would carry only factors for high production and would transmit them to their progeny. There is need to adopt such a constructive breeding practice to-day, for there is no other known way to secure widespread breed improvement. The present methods, which involve extensive and costly culling, are too wasteful to endure now that science has unlocked the secrets of inheritance.

The supply of bulls proved to be prepotent for high production is too limited to afford one for each dairy herd. The small supply and the additional care required in handling old bulls put this program beyond the reach of most small dairy farmers, and so it is recommended only for those who have the time and aptitude for livestock development. Such a breeding program should be attractive to this class of dairymen, for there is a continually growing demand for young bulls that can be used with assurance of success. The spread of genetic knowledge through breeding schools and other extension effort is awakening greater interest in the potential ability of young bulls. When the pure-line breeder has reached the stage where he has largely eliminated low-production factors from his herd he will find a ready market for young sires of pure-line-production breeding. In the meantime, his market will grow up with his breeding progress, since prospective buyers of young bulls are now urged to select only those that are by sires of known ability for transmitting high-production levels. Although such sires have usually demonstrated this ability through their daughters, there is sufficient proof that their sons will also carry the same inheritance for a high level of milk production shown by the daughters. When the breeder adopts this program of continuously using proved sires to develop a pure-line herd, he sets himself up as a purveyor of sons of a proved bull; and each step upward toward the pure line increases the value of his young bulls. Those to whom he sells could well reflect his progress in their own herds by using his young bulls with ever-improving production inheritance.

Way to Success Fully Charted

Pure-line-production breeding offers a new stimulus to the business of breeding profitable dairy cattle, for it is only recently that the way to ultimate success has been fully charted. Those who have the instinct for gambling on results which might follow the use of this or that young bull and those who still have complete faith in the promise

of pedigree will likely carry on as before, but in the end they will fall by the wayside, as have their predecessors of like faith and belief. Successful and constructive breeding has no short cuts, but at least it has been stripped of its mystery, and a definite plan that assures worth-while achievement has been set up.

M. H. Fohrman, *Bureau of Dairy Industry.*

BETTER Feed Crops and Pastures Needed to Cut Dairy Production Costs

When periods of adversity overtake the dairy farmer he can not close up his business and wait for better times. In the first place he has not, in most cases, accumulated sufficient reserve so that he can afford to close up and, in the second place, it would not be the economical thing even if he could. His overhead expense would continue. His cows would need to be fed and cared for even though they were not milked. He must carry on. But there are some things he can do to reduce the cost of producing milk.

In the United States there is an impressively large number of fields of low-yielding crops, and an even more impressive dearth of good permanent pastures. The first step in reducing feed costs is to raise better crops and to improve the pastures. Much of the money spent for feed at the store would bring better returns if spent for lime and superphosphate for the soil. The next step is to select and raise the crops that will produce suitable feed at the lowest cost per unit of nutrients. For example, crop-cost studies indicate that nutrients are produced more cheaply in the form of alfalfa hay than in soybean hay and that in general the hays provide nutrients more cheaply than the small grains. The third step is to adopt a definite, well-thought-out cropping system that will provide the dairy herd with an abundance of suitable feed at all seasons. To do this, one must estimate the requirements of his herd for pasture and hay, and in many cases for silage and grain also. The acreage to be devoted each year to the different crops can then be calculated and a definite rotation adopted. The fourth step is to see that all crops are saved in the condition in which they are best suited for feeding the dairy herd. This applies particularly to the hays. Bright, leafy, early cut hay is not only more nutritious than inferior hay, but since the cows will eat more of it, such good hay makes possible a reduction in the allowance of grain.

Cost Records Covering 14 Years

The Bureau of Dairy Industry has done much experimental work that has provided information on the economical production of milk. For 14 years the bureau kept accurate records of all costs connected with the raising of various crops at the Beltsville, Md., station. The records indicated that alfalfa was not only the best hay but also the cheapest hay. Alfalfa hay was grown at a cost per ton of about two-thirds that of soybean hay. And this was on a soil ordinarily considered unsuited to alfalfa. Alfalfa, corn, and permanent pastures were the crops that showed the greatest profits. A rotation of alfalfa and corn was adopted. All the corn was placed in the silo. A rotation of three years of alfalfa and two years of corn provided roughage in about the desired quantities. A rotation of three years of alfalfa and three

years of corn would have provided the roughage, the bedding, and one-third the grain ration. The bureau also demonstrated that a good permanent pasture could be established in a few years' time and for a small cash outlay, on an old, worn-out soil. The soil used in the demonstration was incapable of producing more than 10 bushels of corn to the acre, yet a good permanent pasture was established on it by applying to each acre a total of 1 ton of ground limestone and 300 pounds of fertilizer, mostly superphosphate, and by applications of cow manure.

Experimental work at the Huntly, Mont., station showed that when cows are fed generously on a good quality of alfalfa hay the grain in the ration can be cut in half or even eliminated entirely. At other field stations the bureau found that cows will eat more of a nicely cured hay than they will of hay that has been damaged by exposure to the sun and rain; also that they will eat more of an early cut hay than of a hay cut at a more mature stage. Furthermore, experiments in dairy-cattle nutrition at Beltsville indicated that cows fed continuously on a poor grade of grass hay do not produce normal calves. No such trouble was experienced when the cows were fed a hay that retained much of its natural green color.

Recognizing the importance of good hay in economical and efficient feeding of dairy cows, the bureau is studying different methods of curing and storing hay. At the Lewisburg, Tenn., station an artificial hay dryer has been operated for three seasons to determine its practicability and the conditions required for its most effective operation. That it will make an excellent quality of hay of high nutritive value and save all the leaves has been thoroughly demonstrated.

The making and feeding of grass silage, a practice that is popular in certain foreign countries, is also under investigation on the theory that if grass can be successfully and economically ensiled at a stage of maturity in which it still contains a high percentage of protein, it by itself will make a complete ration for dairy cows in the winter just as pasture grass makes a complete ration in the summer. If grass silage can be successfully made, the dairy farmer's system of cropping can be greatly simplified since he will need to raise only grass.

Permanent Pasture the Most Neglected Crop

Permanent pasture is the most neglected of all farm crops. The poorest, roughest, stoniest, or most swampy part of the farm generally is devoted to pasture. There can be no objection to this practice because such land can be better utilized for pasture than for any other crop. There is an objection, however, to letting the pastures shift for themselves and to become depleted in fertility and grow up in weeds. Reports show that many pastures even in regions well adapted to the growth of grass produce only enough grass per acre in a season to keep one good milking cow for 30 days, whereas other pastures in the same region keep a cow three or four times as long. By no stretch of the imagination can these poor pastures be termed profitable for milking cows, and their continued use in that condition is indefensible. Especially is this true since it has been abundantly demonstrated that moderate applications of lime (where needed), superphosphate, and manure will work wonders in improving yields, promoting the growth of the clovers and reducing the growth of weeds. There is no more reason to be satisfied with 30 days' grazing to the acre when it is possible to get

163050°—33——19

100 days, than there is to be satisfied with 20 bushels of corn to the acre when it is possible to raise 60 bushels.

Judgment must be used in applying fertilizers to pastures. Nitrogen fertilizers, for instance, are not only expensive but are effective only in the presence of considerable moisture. Over a great portion of the United States there is a deficiency of moisture in the soil during the summer and early fall because of the hot, drying weather. For this reason benefit from applying nitrogen in summer is not expected to be so great in such regions as in the cooler and more humid regions of Europe. It has been found, however, that applications of nitrogen will promote the growth of grass early in the spring so that the pastures will be ready for grazing somewhat earlier than usual, also that the nitrogen increases the yield of grass in the spring while there is considerable moisture in the soil. It is not unlikely that it would be more profitable to follow the English recommendations and depend upon legumes to furnish most if not all the nitrogen, though the cost of the feeds which would be replaced by the extra grass produced by nitrogen fertilization is a determining factor. The higher the cost of dairy feeds the more profitable the application of nitrogen is likely to be.

It has been found that a complete fertilizer increases the protein content of the grass and that on poor soils it also increases the mineral content of the grass. This means, of course, that the grass grown on fertile soils is more nutritious than that on poor soils. There are regions in the United States where the soil is so deficient in phosphorus that the herbage will not properly nourish animals. In such regions applications of superphosphate or other phosphorous-carrying fertilizers are particularly beneficial, both to the yields of the herbage and to the proper nutrition of the animals.

Rather Close Grazing Advisable

It appears fairly well established that pastures should be grazed rather closely, yet not so closely that the animals will be unable to gather their fill. There are several reasons for this. Cows prefer short grass to long grass; there is a decrease in the content of protein as the grass matures; close grazing enables the low-growing clovers to withstand better the competition of the grasses.

The dairy farmer who has an abundance of good pasture, a barn full of good home-grown hay and a silo full of silage, is prepared for adversity; it is the dairy farmer not thus fortified who will have to take the count.

The next problem is making the best use of this feed. Since the nutrients in home-grown roughages are cheaper than those in purchased concentrates, it is obvious that the first consideration in feeding is to make the fullest possible use of the home-grown materials. Cows should be fed to the limit of their appetites on roughage and given only enough concentrates in addition to perfect the ration as regards the protein, the minerals and the total nutrients required.

The necessity for adequate protein in the ration is so well recognized that it need not be discussed here other than to say that the existing feeling against the use of cottonseed meal is unwarranted and is unfortunate because it reduces the use of cottonseed meal, one of the cheapest sources of protein. At Beltsville, numerous experimental attempts to injure cows by feeding them cottonseed meal have failed. Heavy feeding of cottonseed meal at other stations likewise has caused no bad results, when the roughage was of at least fair quality.

So far as minerals are concerned, it appears that the dairyman who allows his cows grass or other green forage in the summer and nicely cured hay in the winter, especially if this hay is raised on a fertile soil, need have little worry about minerals. However, if he wishes to be certain that his cows are receiving an adequate amount of minerals he can use wheat bran as a part of the concentrate ration when the cows are fed a legume hay, and steamed bone meal as 2 or more per cent of the concentrate ration when the cows are fed a nonleguminous roughage. There are areas in the North Central States where cows need more iodine than they normally receive. This deficiency can easily be corrected by supplying iodized salt.

Methods of Apportioning Grain

The usual method of apportioning grain to the different cows is sadly in need of improvement. The feeding of 1 pound of grain to 3 or 4 pounds of milk, depending upon the percentage of fat in the milk, is crude, inaccurate, and not in accordance with accepted feeding standards. One pound of a grain mixture ordinarily contains between 0.70 and 0.75 pound of digestible nutrients; 1 pound of Holstein milk requires about 0.30 pound of digestible nutrients for its production. One pound of grain is enough for only 2.5 pounds of Holstein milk instead of for 4 pounds. Similar calculations show that 1 pound of grain is not enough for 3 pounds of Jersey milk. Now if cows always ate just enough roughage to support their needs for maintenance, it would be easy to apportion the grain by allowing 1 pound for a certain number of pounds of milk. But cows seldom eat the exact quantities of roughage required for maintenance. In fact, when the very best alfalfa hay is fed, the cows will consume enough to provide the necessary nutrients both for maintenance and for production of 25 or more pounds of milk a day. It seems that the sensible way to feed cows would be to find out how much roughage they are eating, estimate how much, if any, production would be taken care of by the roughage that is eaten in addition to that required for maintenance, and then give each cow the quantity of grain needed to satisfy her nutrient requirements. Farmers interested in feeding cows according to their requirements may obtain information on short cuts in figuring rations by addressing the Bureau of Dairy Industry, Washington, D. C.

To summarize: Feed costs can be reduced by raising better and more suitable crops, by following definite crop rotations, by giving more attention to making hay, and by improving the pastures. As home-grown roughage is the cheapest feed it should be used to the fullest extent and only enough grain fed to meet the nutrient requirements of individual cows.

T. E. Woodward, *Bureau of Dairy Industry.*

RECORDS That Show Each Cow's Output Are Basis of Successful Dairying

Ever since dairying has been conducted on a commercial basis dairymen have known that high-producing cows are more profitable than those of lower production, but they have not generally realized just how much is to be gained by increasing the average production of the herd by only a few pounds. Such information is available, however, as the result of a study of nearly 220,000 yearly individual records of the cows on test in dairy herd-improvement associations in 1931.

Relation of Production, Feed Cost, and Income

The records where the butterfat was sold at 30 cents a pound have been summarized in Table 11 to show the rate at which income over cost of feed advanced as production per cow increased.

TABLE 11.—*Rate at which income over feed cost advances as butterfat production per cow increases*

Average butterfat production per cow	Value of product	Feed cost per cow	Income over feed cost per cow
Pounds	*Dollars*	*Dollars*	*Dollars*
100	30	34	−4
150	45	37	8
200	60	41	19
250	75	46	29
300	90	52	38
350	105	56	49
400	120	60	60
450	135	64	71
500	150	68	82

These figures show that the higher-producing cows ate more feed than did lower producers, but that their butterfat production was so much greater that they always excelled the lower producers in gross income and in income over cost of feed. The figures not only show that the high-producing cow is the most profitable cow, but they show to what degree she excels. For instance when the butterfat sold at 30 cents a pound the cow that produced 100 pounds of butterfat a year was carried at a loss. The cow that produced 300 pounds returned almost 5 times as much in income over cost of feed as the cow that produced 150 pounds, and the cow that produced 500 pounds returned more than 10 times as much income over cost of feed as the cow that produced 150 pounds.

Furthermore, high-producing cows are an important factor in successful dairying because of the favorable influence they exert on the market supply of milk and butterfat. One 500-pound cow not only makes more income over feed cost than 10 cows that produce 150 pounds of butterfat each, but the 500-pound cow places only 500 pounds of butterfat on the market while the 10 cows place 1,500 pounds on the market. Low-producing cows not only waste the time of their owners, but they are an important factor in flooding the market with dairy products that sometimes have been produced at a loss.

Profitable and Unprofitable Cows in Nearly Every Herd

In nearly every dairy herd there are both profitable and unprofitable cows. Whether the herd will be profitable or not depends on which class predominates. If in a herd of 20 cows there are only 1 or 2 unprofitable cows the herd may yield a satisfactory profit, but that profit would be greater if there were no loafers in the herd.

It is sometimes asked: "How does the highest-producing cow in the herd compare with the lowest producer in the same herd?" The difference between the top and bottom cows, of course, will vary a great deal in different herds, but the results of a preliminary tabulation

of records of 20-cow herds in the dairy herd-improvement associations are enlightening. According to this tabulation, the highest-producing cow in the average 20-cow herd produced more milk and butterfat than the 2 lowest producers in the same herd; she returned as much income over cost of feed as the 3 lowest producers, and more net profit than the 7 lowest producers. Compared to the highest-producing cow, the 7 lowest producers consumed five and one-half times as much in dollars worth of feed, they returned less net profit, and they placed four times as much milk and butterfat on the market. Here again we have an example of low-producing cows flooding the market with milk produced at a loss.

Fewer and Better Cows

Thousands of dairymen are feeding and milking low-producing or unprofitable cows, when they might easily raise the average production of their herds and make a greater profit by keeping fewer but better cows. But without records to guide them, their efforts to build such a herd would necessarily be based on guesswork.

Every dairyman should manage to obtain records of the production, feed cost, and income of every cow on his farm. Records are the foundation on which he must build for progress; they are the instruments through which successful dairying is made possible. Whether he himself tests his cows, weighs their feed, and computes their income, or assigns the job to somebody else, is of secondary importance; the important thing is that he gets the information.

How Records May Be Obtained Economically

Usually the most satisfactory and economical method of getting the necessary records is through membership in a dairy herd-improvement association. A dairy herd-improvement association is an organization of about 26 dairy farmers who cooperatively employ a man to test their cows for milk and butterfat production and to determine the cost of that production for every cow in the herd. The records thus obtained enable the owner to determine the kinds and amounts of feed that he may feed to each cow for economical production, and to locate the unprofitable cows and eliminate them from his herd. Membership in one of these associations usually costs about $3 a year per cow.

That the average member of a dairy herd-improvement association makes good use of the records and other information he obtains is evident from the fact that the average production of all association cows has steadily increased year after year throughout the 25 years the associations have been operating. The cows on test in these associations in 1931 averaged 306 pounds of butterfat, or 91 pounds more than the cows in the first association in 1906; this is ample evidence that it is possible not only to raise the average production of a dairy herd, but that it may be raised largely by intelligent use of information obtained from association records.

Keep the Best, Cull the Rest

No dairyman should allow himself to become a slave to his herd. Through intelligent culling, feeding, and breeding, even a low-producing herd can soon be transformed into a higher-producing and more profitable herd. Herd-improvement association records indicate that

the first step in the improvement of a dairy herd is intelligent feeding. Every cow in the herd should have a chance to demonstrate what she can do when well fed. If she does not respond to good feed and care she should be discarded. This procedure should be continued until only profitable producers are left.

A certain member of a dairy herd-improvement association owned 20 cows. The production and income records showed that three of them did not produce enough to pay for the feed they ate. He was offered $120 for the best cow in his herd. Her yearly record showed that she had returned $125 above her feed cost. After consulting his records, he decided it would be wiser to sell the poorest three cows to the butcher for $120 than to part with his highest-producing cow. By selling the poorest three cows he accomplished three things—he cut labor costs, increased his working capital, and added to his profits.

Step Production Up

No herd is hopeless. Close culling will nearly always lift even the poorest herd to a profit-bearing level. Even if close culling alone doesn't do this, it will always win if followed by intelligent breeding and feeding. Even in times of falling prices for dairy products, culling will help step production up to a more profitable level.

One member of a dairy herd-improvement association is making more money from his dairy herd now than he did several years ago when prices for dairy products were higher. The records showed that the average production of the 11 cows on test in his herd in 1929 was 266 pounds of butterfat per cow. Two years later the herd consisted of 9 cows whose average butterfat production was 366 pounds, an increase of exactly 100 pounds of butterfat per cow. Within these two years though the price of milk and butterfat had fallen the income over cost of feed for the 9 cows in 1931 exceeded that of the 11 cows in 1929. With higher production per cow his net income was higher though prices were lower.

Records or Guesswork

The dairy herd-improvement association has taken much of the guesswork out of dairying. It measures progress. It tells the dairyman definitely whether his herd is profitable or unprofitable. It does more than this, it tells him the extent of the profits and losses. Better yet, it tells him which cows are making the profits and which are causing the losses. This knowledge takes guesswork out of herd building. To be sure, the dairyman must take all known precautions to guard his herd against diseases. Having done this, he can rely on the yearly individual-cow production records of his herd to guide him in building a dairy herd that will improve his income.

J. C. McDowell, *Bureau of Dairy Industry.*

QUALITY in Dairy Products Depends on Numerous Factors Other than the Butterfat, High quality in milk and other dairy products does not necessarily mean that these products contain a high percentage of butterfat, but rather that they are pleasing in flavor, body, texture, and appearance, and that they are clean and free from undesirable bacteria.

Because dairy leaders, health officials, and others have long realized the importance of quality, dairy products of high quality are to-day available to a large percentage of the people in the United States. The best interests of the dairy industry, and of the people as well, will not be fully served, however, until the entire supply has been improved to such an extent that all consumers at all times can obtain dairy products of high quality.

Quality Influences Consumption

Dairy products occupy an important place in the human diet—important to the consumer from the standpoint of their nutritive value, and important to the producer from the standpoint of the quantity consumed. Dairy products will continue to hold this important place only so long as their quality is satisfactory to the consumer. Health officials and nutrition authorities urge the public to use dairy products regularly and liberally. The dairy industry will have this support only so long as it merits it by supplying the consumer with products that meet the high standards that have been established for them.

Since milk forms so large a part of the food for infants and children, and their health or even their life may depend upon this one food, the dairy industry is morally responsibile for providing the best milk that can be produced and distributed.

In addition to being an essential food for children, high-quality milk is widely used by adults. When milk with an abnormal flavor is served, the average person detects the off flavor immediately and refuses to drink the milk. Serving such milk repeatedly will, in a short time, cause a habitual milk drinker to discontinue the habit. On the other hand, in communities where the quality of milk is high, the per capita consumption is high.

Butter occupies a unique place in the diet because of its characteristic flavor and pleasing body and texture, as well as its high nutritive value. Butter is almost the only fat used as a spread on bread. The flavor of many other foods is improved by adding butter, if it is of high quality. Low-quality butter loses its unique place in the diet and may readily be replaced. The quantity of butter used is directly influenced by its quality.

The prosperity of the dairy industry depends on maintaining an active demand for its products; this demand can be stimulated by providing the consumer with high-quality dairy products.

Quality and the Farmer's Income

It is estimated that the dairy farmers of this country could increase their income by millions of dollars annually simply by improving the quality of the milk and cream they produce. The loss of income because of low quality is incurred either because the milk and cream are rejected at the market or because they are accepted only at a reduced price. Milk plants, condenseries, or ice-cream or cheese factories can not use milk that is sour or that contains objectionable flavors. Such milk is usually returned to the producer, who not only receives no pay for it, but loses the cost of its production. It is estimated that more than 1.5 per cent of all milk produced for market-milk purposes in the United States reaches the market unfit for use.

This causes an enormous financial loss to dairy farmers. Much of the milk delivered at milk plants meets the minimum requirements but is not of a quality as high as is desired. Many milk dealers who realize the importance of quality pay a premium for milk that is of higher quality than their minimum requirement; this premium is usually from 20 to 70 cents per hundred pounds. Other dealers apply their base price to milk of a high standard and pay 15 to 20 cents a hundred pounds less for milk that is acceptable, but not up to their standard. Many dairy farmers do not produce milk that brings the highest price on their markets and their incomes suffer accordingly.

Among the manufactured dairy products, butter affords an excellent example of the relation of quality to the farmers' income. On the wholesale markets butter is graded according to quality, flavor being the principal factor considered. The importance of quality is reflected in the selling prices of the several grades. For example, the average wholesale price of high-quality butter (93 score) on the New York City market for the 5-year period 1927–1931, was 41.83 cents a pound, while the average price of low-quality butter (88 score) was 37.38 cents, or a difference of 4.45 cents a pound.

It is evident that the farmer who markets cream that can be made only into 88-score butter should not receive as much for it as he should for cream that can be made into 93-score butter. At some creameries all grades of cream are accepted and the price paid is in direct relation to the quality of butter that can be made from the cream. In this case the farmer who delivers low-quality cream knows definitely how much his income is affected, and can change his practices accordingly. Unfortunately, however, at many creameries the same price per pound of butterfat is paid for all cream. The creamery that receives high-quality cream and makes high-quality butter is naturally able to pay the farmer a higher price per pound of butterfat than the creamery that accepts low-quality cream and, therefore, makes low-quality butter.

The main factors essential to the production of high-quality milk and cream are: (1) Clean and healthy cows and milkers; (2) small-top milk pails; (3) utensils thoroughly washed and treated to kill bacteria; (4) prompt cooling of milk or cream and keeping it cold until delivered; and (5) feeding no highly flavored feeds shortly before milking. When milk or cream of high quality has been produced, it obviously is equally important to get it to market before the quality deteriorates.

The factors essential in the production of high-quality milk and cream do not involve the purchase of expensive equipment but rather the use of proper methods. If these methods are used the milk drawn from the healthy cow contains no objectionable flavors and relatively few bacteria, none of which are harmful; it does not deteriorate while on the farm, because it is handled in clean utensils, is cooled promptly and kept cold, and is marketed quickly.

The Plant Operator's Interest in Quality

Managers of dairy-products plants are vitally interested in quality because it plays a large part in the successful marketing of their products. Whether their product is sold directly to consumers, or to dealers, defects in quality bring prompt complaints or return of goods and quickly reduce the volume of sales; if the product is sold subject to grading on the market, as butter and cheese frequently are sold, the low-quality product sells at a low price.

Only in comparatively few plants are defects in quality caused by defective methods or equipment in the plant. A competent manager does not permit such defects to continue. In general, therefore, it may be said that in a well-managed plant the quality of the milk or cream received is the main factor that influences the quality of the finished product. Improvement in quality of the dairy products on the markets, therefore, is mainly a matter of improvement in the quality of the milk and cream that the farmer delivers to the plant.

Obtaining High-Quality Milk and Cream from the Farm

Because of the relation of market milk to the public health the milk supplies of all large communities and of many small ones are supervised by public-health officials. This is desirable because it assures the consumer that the milk is clean and safe for food. In addition to meeting the minimum requirements of the health official, however, milk must be of excellent flavor to have high quality. The production of high-quality milk, is, therefore, more than a public-health problem. The enforcement of regulations may bring about a wholesome milk supply but the production of uniformly high-quality milk can be effected only through education of the producers. The leadership and vision for this educational work should be supplied by the extension services of the State agricultural colleges and should be coordinated with work of the State departments of agriculture and with the regulatory work of health departments or other control agencies.

Managers of milk plants and dairy-products manufacturing plants should not leave the burden of quality improvement wholly to health officials and educational agencies. They can aid greatly by providing an incentive for the farmer to produce high-quality milk. The most effective incentive is the payment of premiums for milk that is above the minimum standard adopted by the plant. This system is being used at a number of milk plants but should be more widely adopted by market-milk plants and dairy-products manufacturing plants.

Butter-manufacturing plants usually purchase cream instead of milk from the farmers. The highest-quality butter can be made only when cream is received sweet and clean in flavor. The practice of accepting sour cream has become widespread and the extensive use of the cream separator on the farm has resulted in much cream being produced on farms in such small quantities and so far from market that it is not economically possible for the farmer to deliver it fresh and sweet. This, however, is no reason why he should not be encouraged to deliver high-quality cream.

One of the big problems for farmers living several miles from the creamery and having but a few cows, is how to deliver cream frequently without excessive cost. This problem is frequently solved by community delivery; that is, three or more farmers take turns going to the creamery, taking their own and their neighbors' cream, or one man may do all the hauling for his community, charging his neighbors a proportionate share of the cost of hauling, usually on a basis of the pounds of butterfat hauled. This type of cream-gathering route, in sections where the number of cows per farm is small, is usually less expensive and more satisfactory than gathering cream by a truck owned and operated by a creamery. During the school term the hauling problem is sometimes solved by having the children take the cream to the creamery on their way to school.

Experience at many creameries has shown that the procedure most effective in improving the quality of cream delivered is to grade the cream and pay for it according to the quality of butter that can be made from it.

Among the creameries that have adopted grading systems there is a great lack of uniformity in the requirements for the several grades. Each creamery defines its grades to suit its particular conditions, except in those States where official grades have been established by law. It is only natural that, in a highly developed dairy section where the manufacture of high-quality butter is well established, the grading of cream is on a higher standard than in a section where dairying is carried on as a side line.

Adopting a grading system and paying a premium for high-quality cream usually will not be sufficient to greatly improve the quality of the cream, unless they are accompanied by a carefully planned campaign to interest every patron in the plan and to aid him in producing cream that will meet the highest requirements. County agents and home demonstration agents are the logical persons to visit producers and advise them on all phases of producing first-grade cream.

A Quality-Improvement Program

Improvement in the quality of dairy products has always been one of the objectives of the Bureau of Dairy Industry. Research work has produced fundamental information on factors that affect the quality and keeping properties of dairy products. New and improved methods of manufacturing dairy products have been developed as a result and information on factors involved in the production of high-quality milk has been published.

In their quality-improvement work with creameries and cheese factories, the bureau specialists have given specific advice and personal assistance to the managers of the plants. When the problem was one of plant technic, improvement in the quality of the output was usually made very quickly; but where the improvement in the finished product could be made only by obtaining a higher-quality milk or cream from the farm, progress has usually been slow. Very satisfactory results are being obtained, however, at plants that continue to apply a proper plan of quality improvement. At one creamery that frequently has received assistance from a bureau specialist, the per centage of high-quality cream received has increased from about 10 per cent of the total receipts in 1924 to approximately 90 per cent in 1931. This plant provided an incentive for the farmer to deliver high-quality cream by paying a difference of 3 cents per pound of butterfat between the grades of cream. Because of the success of this creamery in improving the quality of its butter by paying for cream according to grade, six neighboring creameries have adopted the same system. They are all making excellent progress in improving the quality of cream delivered by the farmer and in the quality of butter manufactured from it. Many other plants would profit by adopting the same plan.

Recently the bureau has outlined two complete milk-quality improvement programs. The first of these is for extension workers. To be most effective, it should be operated on the area plan; that is, the work should be concentrated in a limited area of one to three counties at the start. The principal objective is to bring about the general adoption of approved sanitation practices on all dairy farms in the

area. When the producers in the selected area have learned the essentials of quality-milk production and are practicing the approved sanitation methods, the area will serve admirably as a demonstration area in extending the work to other areas or counties until the entire State has been covered.

Program for 4-H Dairy Clubs

The second milk-quality improvement program is for 4-H dairy clubs. Its object is to acquaint members of 4-H dairy clubs and other junior clubs with the importance of quality in milk, both from the economic standpoint of the producer and from the health standpoint of the consumer, and to teach the essential requirements in the production of high-quality milk. By promoting these two projects the bureau hopes to overcome much of the economic loss that dairymen are now incurring by producing other than high-quality milk.

All dairy interests should realize that improving the quality of dairy products is the most important problem before the industry. The industry has been so actively engaged with feeding and breeding for increased production that it has not given proper attention to the quality of the ultimate product. It is now time for producers to realize that if they are to profit from increased production they must extend their market to take care of the increased production. The market can be extended by improving the quality of dairy products, thereby stimulating the demand. No other phase of the dairy industry is so vital to its future welfare or will pay larger dividends all along the line.

WILLIAM WHITE *and* C. J. BABCOCK, *Bureau of Dairy Industry.*

DAIRY Products' Nutritive Value Justifies Large Place in Family Diet

The value of milk in the diet of the adult seems almost eclipsed in the public mind by the emphasis placed on the importance of milk in infancy and childhood. And yet nutritionists constantly call attention to the whole family's need for milk and its products because of their nutritive value. Milk contributes more to good nutrition than does any other single food. It is an outstanding source of calcium, and contains appreciable quantities of some of the other minerals also. All of the six vitamins now known occur to some extent in milk, and for two of them, vitamin A and vitamin G, milk is an exceptionally good source. The proteins of milk are efficient in building and maintaining muscle structure, while milk fat and milk sugar are good sources of energy.

The calcium and the vitamin content of milk would alone justify the prominent place that milk occupies among the protective foods. The human tooth and bone structure, completed during adolescence, must be kept in sound condition by a proper combination of calcium, phosphorus, and vitamins A, C, and D. Milk is, on the whole, the best single food for the building and upkeep of the teeth and bones. As a source of calcium in the diet, it has no equal among foods. Adults who scoff at the idea of their daily need for milk forget that the calcium requirement is continuous throughout life.

Vitamin A is present in the fat of the milk. This vitamin, essential for normal growth and for vitality, also helps to keep the body tissues healthy. In this way it increases resistance to bacterial infections such as those that occur in the sinuses, throat, and ears. A long-con-

tinued lack of vitamin A causes a serious eye infection, xerophthalmia and eventual blindness. Whole milk, cream, butter, and cheese made from whole milk are usually considered rich sources of vitamin A, though the quantity in milk and its products varies greatly with the type of feed given the cow. The vitamin A content of milk is always high when cows are on green pasture, and may be kept up during the winter if the feed is properly selected.

Milk in all of its forms is one of the most valuable sources of vitamin G. This vitamin is of constant importance to everyone because it affects not only growth, but also health and well-being at all ages.

Since vitamin G is not easily destroyed by heat, it occurs in canned, dried, and cooked milk, as well as in market milk. Skim milk, either fresh or dried, buttermilk, and cheese made from skim milk or from whole milk, are also valued for their vitamin G content.

Vitamin D is present in limited quantities in the fat of milk. The person who uses whole milk, cream, butter, cheese, and ice cream liberally can count on dairy products as a source of part of his vitamin D requirement. This vitamin, needed by both young and old, is especially necessary in childhood because of its influence on the normal development of the teeth and hones. Since rickets may develop if vitamin D is not present in the diet in sufficient quantity, infants and young children need cod-liver oil to supplement the vitamin D content of milk.

Vitamin-D-Enriched Milk

There are only a few naturally rich sources of vitamin D, but it can be produced by ultra-violet rays acting on a chemical substance called ergosterol which is found in a number of foods and in the skin of human beings and animals. To make a food richer in vitamin D it may be "irradiated" by exposing it directly to the rays of an ultra-violet lamp. Some kinds of dried milk treated in this way and sold in containers labeled "irradiated," are better in antirachitic properties than fresh milk usually is. To a small extent fresh milk is enriched with vitamin D and is sold by dairies in a few cities as irradiated or vitamin-enriched milk. Such milk is usually produced by feeding irradiated foods to the cows, but by another method recently developed vitamin D concentrates may be put directly into the milk.

Milk is a fair though not a rich source of vitamin B. Everyone needs a regular supply of this vitamin to stimulate the appetite, maintain normal muscle tone, and prevent nervous irritability. Expectant and nursing mothers especially need vitamin B because it influences both the quantity and the quality of human milk.

Though the quantity of vitamin B in milk is not large, the daily use of an abundance of milk may make it a fairly good source of this vitamin for most children and adults. Vitamin B is, however, more easily affected by heat than vitamins A, G, or D, and cooked, canned, and dried milk are therefore likely to have their vitamin B content at least partly destroyed.

Effect of Heat on Nutritive Value

The effect of heat on the nutritive value of milk is a question often raised in connection with the selection of the milk supply. Heat may cause the coagulation of some of the proteins and a slight precipitation of calcium salts. It may destroy a good deal of the vitamin C present and may also decrease the vitamin B content somewhat. To what

extent these changes occur depends somewhat on the temperature and somewhat on the length of time and conditions of heating. Losses in nutritive value caused by commercial pasteurization are very slight and are insignificant when compared with the protection to health that pasteurization gives by destroying harmful bacteria. Changes in food value during cooking or even during the evaporation and canning or the drying of milk are of little importance because it is so easy to make the losses good by other foods in the diet of both children and adults.

The consumer, in selecting a milk supply of high food value, whether he is considering raw, pasteurized, evaporated, or dried milk, must determine his choice partly by the quality of market milk available in his locality, and partly by the size of his pocketbook. High-quality milk of uniform composition is now widely available in raw, pasteurized, evaporated, and dried form. To be safe from the standpoint of health, raw milk must be low in bacterial count. To produce and distribute such milk requires sanitary measures that are expensive. For this reason, raw milk of exceptional purity is usually of the certified quality, which costs about double the price of ordinary good bottled milk. In this country pasteurized milk of high grade is much more extensively used than raw milk. In many communities, however, both evaporated milk and dried milk give more nutritive value in return for the amount of money spent than does either raw or pasteurized milk at the local prices.

A Dependable Source of Calcium

Summing up the facts about nutritive value, milk when taken in suitable quantities may be considered a dependable source of calcium, phosphorus, protein, vitamins A and G, and an appreciable source of some of the other vitamins and minerals and of energy-yielding materials. In infancy and very early childhood milk is the basic article of the diet, and is carefully supplemented by other foods. In later childhood and adult life the emphasis changes somewhat, but milk (or cheese and butter) still has an important rôle to fill. It fills the gaps in the usual mixed diet as no other single food can. And in low-cost diets where a large proportion of cereals must be used because of their cheapness, milk is a very important safeguard to health. The use of milk in commercial baking of bread has helped materially to protect the nutritional condition of families whose diet has had to consist largely of bread.

The Milk Quota

The quantity of milk the family needs depends partly on the variety of the diet and partly on the composition of the family group. A generous daily allowance is 1 quart (or its equivalent in other dairy products) for every child, 1 quart for every pregnant or nursing woman, and 1 pint for every other adult. This allowance includes milk used in food preparation as well as milk taken as a beverage. In varied diets in which milk can be carefully supplemented in nutritive value by other foods, three-fourths of a quart of milk may be adequate for the child. A pint a day is the very least he should have during his growing years, and one-half pint is the least for an adult. These very limited allowances are very likely not to meet fully the need for calcium, and are certainly not sufficient for families on restricted diets. When food money is scarce, so that the use of leafy and other watery vegetables and fruits and meat must be curtailed, the more

generous milk allowance of a daily quart for each child and at least a pint for each adult is advisable. The less money there is for food the more important it is that the whole family use plenty of milk and milk products. One outstanding nutrition chemist says that whatever the amount of money available for food, it is wise from the standpoint of nutrition to spend as much for milk (including cream and cheese if they are used) as for meats, poultry, and fish.

Milk Products

The low cost of canned evaporated milk and of the various dried milks has been a boon to everyone planning very inexpensive and emergency diets. Dried skim milk, costing only a few cents a pound when bought in barrel lots, is the cheapest of all sources of calcium and protein. It is also a good source of vitamin G.

The results of recent nutrition studies indicate that the food value of skim milk has been too long underrated. Though it is true that removing the cream lessens the fuel value, decreases the flavor, and removes most of the vitamin A and D content, yet the materials that are left are so valuable for growth and protection of health that skim milk is an important supplement to limited diets of both children and adults. Skim milk, both fresh and dried, has been successfully used in the cure and the prevention of pellagra, a deficiency disease caused by inadequate diets of highly milled cereals, sweets, and lard or salt pork. When skim milk is added to a very restricted diet, it is important to provide some inexpensive source of the fat-soluble vitamins and the fat lost through the removal of the cream.

Diets planned to reduce body weight or to prevent rapid gain of weight use skim milk freely to meet the constant need for calcium. In this type of diet, which must be low in fuel value, skim milk is more suitable than whole milk, and its deficiency in vitamin A is easily taken care of by the use of an abundance of green or yellow-colored vegetables, especially green leaves, and a small allowance of butter.

Buttermilk is similar to skim milk in food value, and may be used to special advantage in the weight-reducing, the low-cost, and the pellagra-preventing diets. Because of its flavor and consistency the uses of buttermilk are somewhat more limited than sweet milk. Many adults, however, prefer it to sweet milk as a beverage, drinking it either plain or sweetened a little and flavored with lemon juice. And in many homes buttermilk takes the place of clabbered sour milk in making biscuits, cakes, and other baked goods.

Butter and cream are valued in general for their vitamin A content, their pleasing flavor, and the ready digestibility of their fat. These dairy products afford the person who is trying to gain weight a very palatable means of slipping many extra calories into the day's diet.

The "full-cream" or whole-milk cheeses are as a class very concentrated food, rich in protein, fat, calcium, and vitamins A and G. Cottage cheese and other kinds made of skim milk lack the fat and vitamin A, but are good sources of protein, calcium, and vitamin G. The high food value of cheese places it logically in the main part of the meal, though the characteristic flavor of some varieties puts them in the salad or dessert course. Like milk, whenever cheese is used in the meal or between meals, it should have full credit for its contribution to the nutritive requirements of the day.

ROWENA SCHMIDT CARPENTER, *Bureau of Home Economics.*

PROBLEM of Finding Uses for By-products of Dairy Industry Partly Solved

When milk is sold for direct consumption or made into evaporated or condensed milk, all its constituents are utilized and there is no waste. On the other hand, when milk is made into butter only one of its constituents—the fat—is used, while all of the others go as by-products in the skim milk and buttermilk. In cheese making the casein and the fat are used and the lactose, soluble proteins, and minerals remain in the whey.

The quantity of this by-product material is so great that it is hard to visualize. To make the 1,600,000,000 pounds of butter produced each year in the creameries of the United States requires the butterfat from about 36,000,000,000 pounds of milk. After the butterfat, in the form of cream, is removed, there is left 31,000,000,000 pounds of skim milk containing nearly 3,000,000,000 pounds of milk solids, and after the cream is made into butter there is left 2,300,000,000 pounds of buttermilk containing an additional 200,000,000 pounds of milk solids.

To make the 500,000,000 pounds of cheese (not including cottage and pot cheese) produced annually in the United States requires approximately 5,000,000,000 pounds of milk. Nearly all the butterfat and the greater part of the protein in the milk are utilized in the cheese, but the 4,500,000,000 pounds of the by-product whey resulting from the manufacture of this cheese contains 300,000,000 pounds of milk solids.

This means that the dairy farmers who produce milk for butter and cheese are producing a total of 3,500,000,000 pounds of milk solids that are not utilized in the butter or cheese. Of course, the value of these solids is not entirely lost to the dairy industry, for much of the skim milk, buttermilk, and whey is fed directly to farm animals. Considerable quantities of these by-products are also utilized in the manufacture of concentrated and dry skim milk, buttermilk, and whey for human and animal consumption. Nevertheless, it is of great economic importance to the dairy industry that additional market outlets for these solids be found. With the development of new or more efficient ways to utilize the food value of dairy by-products, either in animal or human nutrition, and with the discovery of new industrial uses for milk solids, this enormous quantity of by-product material should have a wider market demand and the returns to the dairy industry should be correspondingly greater.

Milk Solids Not Fat Are Valuable

The production of the milk solids other than fat requires nearly as much feed as is required to produce the butterfat on which the value of the milk is based, and under the most favorable conditions the market price for the solids not fat is only one-fourth that of the fat. Yet, even at this unfavorable ratio, their value is worthy of consideration. Each increase of 1 cent a pound for the 3,200,000,000 pounds of solids in skim milk and buttermilk from butter manufacture would return $32,000,000 more to the dairy industry each year. That is as much as would be realized by an increase of 2 cents a pound for the butter. If the 300,000,000 pounds of solids in whey could be sold for 1⅔ cents a pound the returns would be equivalent to an increase of 1 cent a pound in the price of cheese.

Whatever may be the reason for the low market price of the solids not fat, it is not that they do not have value as foods or for technical

applications. In the skim milk produced in butter manufacture and in the whey produced in cheese making there is a total of 1,200,000,000 pounds of protein, 55,000,000 pounds of fat, and 1,700,000,000 pounds of milk sugar. In digestibility and completeness of assimilation these are among the most perfect foods of their class. The sugar has certain properties that give it especial value in the nutrition of infants. Even the mineral constituents, which amount to nearly 300,000,000 pounds, are peculiarly adapted for nutritive purposes.

Great quantities of these solids are converted into food for human use by feeding them to animals, but this results in a great loss of nutritive value. It is obvious that additional quantities would be utilized if they were incorporated in attractive human-food materials that could be sold in competition with other foods of equal nutritive value. The Bureau of Dairy Industry is continually trying to develop efficient methods of incorporating these raw materials into products that are used directly as human food. So far as possible these methods should utilize all the constituents as they exist in milk, but for special purposes it is sometimes necessary to separate one or more of the ingredients.

Dry Skim Milk Has Wide Use

The most efficient way to utilize skim milk is first to reduce it to a powder by removing the water. In the dry form, skim milk has a wide use in various food products, particularly in bread and ice cream. Adding dry skim milk to bread not only makes a more nutritious bread, but improves the flavor and appearance and increases the volume so much that the extra loaves obtained from a barrel of flour will nearly pay for the powder.

Adding as much as 12 pounds of dry skim milk to a 200-pound barrel of flour has been found advantageous. If dry skim milk should be added in this proportion to half the flour consumed in the United States a profitable market would be created for one-fifth of the skim milk produced in the manufacture of butter. The consumer would obtain a more nutritious and more palatable bread, and the returns to the milk producer would be increased. Furthermore, because the creamery would require fresh, sweet, skim milk from which to make the powder, it would be necessary that the patrons deliver only sweet milk to the creamery. Such milk would provide an improved quality of butter, and butter consumption would increase correspondingly.

Casein Has Many Uses

The individual constituents of milk offer abundant material for the development of marketable products. Casein is already manufactured and used extensively. A small quantity is used in preparing special foods, but by far the greater part is used in the arts. Casein has peculiar properties that make it valuable in many unusual ways. When treated chemically it becomes plastic and may be molded into any desired shape. Further treatment makes it so hard that it can be given a high finish. In this form it is used in a great variety of objects, such as buttons, penholders, combs, knife handles, and switch plates. In an alkaline solution it is an excellent adhesive and is used in making glue that is especially valuable in furniture, airplanes, and other articles exposed to dampness. The adhesive property is also utilized in insecticides and fungicides to make them spread evenly on the leaf and adhere when they dry.

The most important use of casein is in the manufacture of coated paper. More casein is used by the paper-coating industry than by all other industries combined. The glossy finish of book and magazine paper is obtained by coating the paper with finely divided china clay and polishing the surface with steel rollers. Casein is the most satisfactory adhesive for holding the china clay on the paper. In cooperation with the paper laboratory of the Bureau of Standards, the Bureau of Dairy Industry has been investigating the properties of casein, especially in relation to the manufacture of a casein suitable for coating paper. It is essential that the casein dissolve readily and completely in alkalies, that it spread evenly and smoothly over the paper, and that it be highly adhesive so that it will not be necessary to use an excessive amount. Foaming of the solution is a common difficulty and is objectionable because where bubbles occur the paper is not coated. Paper coaters are put to considerable expense for the purchase of foam removers. The manufacture of casein has been unsatisfactory largely because the paper coaters have been unable to determine the quality of the casein without making actual coating tests and because the makers did not know that a special technic must be followed to make a casein with the desired properties.

Manufacturing Methods Studied

Recent investigations by the Bureau of Dairy Industry show that casein of entirely satisfactory quality can be made with the usual simple equipment by giving proper attention to such details of technic as the chemical reaction of precipitation, the temperatures at the various stages of manufacture, and other factors easily controlled by an intelligent operator. By small variations in the manufacturing methods, casein that will invariably foam in a coating mixture or that will not foam under ordinary circumstances, can be made. These investigations also produced tests that may be applied to any lot of casein to determine its suitability for coating paper; thus making it possible to purchase casein according to grade, and to pay a premium for superior quality. If these methods are generally adopted by casein manufacturers a product of uniformly satisfactory quality will be obtained and there will be no reason for using imported casein because of its reputedly more desirable qualities.

The Problem of Lactose, or Milk Sugar

The most difficult problem in connection with the utilization of dairy by-products is to find an outlet for the vast amount of lactose, or milk sugar, that is potentially available. At present the principal use for lactose is in the preparation of modified milk for infant feeding. A small amount is used as a filler or binder in medicinal tablets, but the few million pounds that are produced annually supply the entire market. Lactose has certain properties that give it exceptional value in the diet. It is not digested in the upper part of the digestive tract, but is carried into the large intestine, where it has a tendency to encourage the growth of acid-forming bacteria of the acidophilus type and thus to inhibit the development of undesirable putrefactive bacteria. On the other hand, it has only slight sweetness and a low solubility, which make it difficult to use in many food products. Under certain conditions it crystallizes in a form known as beta lactose, a

form that is sweeter and more soluble than the ordinary lactose of commerce. The bureau's laboratories have perfected a method by which the beta form can be manufactured at little or no increase in cost over that of manufacturing the ordinary alpha lactose of commerce. This new form, which is more palatable than the older one, and which may be made at a reasonable cost, has recently been placed on the market.

There are possible outlets for lactose in certain industries from which it is now excluded by the high cost of manufacture. It is possible, for instance, to substitute lactose for glycerin in the manufacture of certain explosives. For this purpose the sugar must be reasonably free from proteins but need not necessarily be as pure as that demanded for the pharmaceutical grade. The whey from which the sugar must be separated is, from a chemical standpoint, a complex solution which makes the separation of a pure sugar a matter of some difficulty. The bureau laboratories have been working on this problem for some time and are completing a factory method by which a grade of lactose, sufficiently pure for ordinary commercial uses, can be made at a relatively low cost. It is expected that this will make it possible to use lactose in certain foods in which its lack of sweetness will be an advantage rather than a drawback.

The Soluble Proteins

When the fat, casein, and lactose are removed from milk there still remain the soluble proteins consisting very largely of albumin. The albumin of milk resembles somewhat the albumin of egg and has a high nutritive value. All of the amino acids making up its complex molecule are assimilated by the digestive system so that it is what is known as a perfect protein. Of perhaps even greater importance is the physical effect it has when the casein of milk is precipitated in the stomach. Human milk, which contains more than twice as much albumin as cow's milk, is coagulated in fine flocks and is easily digested. Cow's milk, on the other hand, has a tendency to coagulate in large masses which digest slowly. This difficulty could be overcome if the albumin now discarded in whey could be separated in its natural state and added to cow's milk for infant feeding.

In making commercial milk sugar from whey the albumin is precipitated in such a way that its solubility is destroyed and it has little value. But the bureau laboratories have developed a method by which the sugar is crystallized from the concentrated whey, leaving a mother liquor containing some of the sugar, most of the minerals, and all of the soluble proteins. With proper precautions this solution may be dried without affecting the solubility of the albumin. The lactose contained in this powder is not objectionable, but the salt content is so high that the powder is not suitable for modifying milk. It has been found that the greater part of these salts can be removed without affecting the other constituents by subjecting the concentrated whey to electric dialysis before drying it, and an apparatus in which this can be done on a factory scale has been devised. After dialysis and desiccation a powder completely soluble in water is obtained. When added to cow's milk in the proper proportion it changes the physical properties of the milk so that when it is acted on by the acids of the stomach it is coagulated in the finely divided flocks characteristic of human milk.

L. A. Rogers, *Bureau of Dairy Industry.*

POULTRY and EGGS

POULTRY Industry Fairly Resistant to the Depression The poultry industry is considered by many persons to be of minor importance in American agriculture, yet the estimated gross farm income from poultry and eggs in 1931 totalled about $800,000,000, and was exceeded only by that from dairy products and that from hogs.

According to the census of 1930, poultry and eggs were produced in 1929 on more than 5,373,000 farms, or about 85 per cent of all the farms enumerated. In addition to the large number of poultry and egg enterprises on farms reported by the census, it is estimated that there are from one-third to one-half million small flocks not on farms. It was estimated that the total number of chickens on farms in the United States on January 1, 1930, approximated 470,000,000, this being the greatest number of record for any January 1. Since that date, numbers of chickens have declined coincidentally with declining prices.

The 1930 census reported 763,092,052 chickens raised on farms in 1929, with 16,794,485 turkeys, 11,337,487 ducks, and 3,989,831 geese, chickens making up about 95 per cent of all poultry raised.

The regional distribution of chickens is shown in Figure 46.

The average farm-poultry unit has an inventory value of less than $100, yet even with the indifferent care given many flocks, the value of its product for consumption or sale in 1931 approached $100 for eggs and $67 for meat.

Although this industry is carried on so extensively and the value of its product is so great, most of the individual units of production are so small that the industry is poorly organized, and in many flocks scant attention is paid to proper methods of production. A small flock of chickens can be kept in almost any manner—well or poorly housed, fed almost any kind or amount of feed and compelled to forage for the rest, and it will still produce some meat and eggs for home use, and possibly some for sale.

Fifty-five per cent of the poultry flocks enumerated in April, 1930, contained fewer than 50 chickens per flock and an average of only about 23, equivalent to an annual production of about 41 chickens per flock, or little if any in excess of the needs of an average farm household. About 77 per cent of the farms reporting chickens showed less than 100 per flock. This indicates the large use of poultry and eggs as food on the farm. The market value of the surplus meat and eggs from these flocks is a very small item of the farm cash income.

Flocks containing more than 400 chickens were reported by only 1.3 per cent of all the farms reporting poultry, but these farms reported about 13 per cent of all the chickens. The explanation of the small proportion of poultry flocks of commercial size probably lies in the fact that an increase in the size of the flock necessitates a greater than proportional increase in expenditures and introduces many important technical problems, such as breeding for high egg production, proper housing, control of disease, and efficient feeding—all of which requires special knowledge and more than average managerial ability if the commercial enterprise is to be successful. There is considerable evidence, however, that proper methods of production are being increasingly adopted by the owners of small farm flocks.

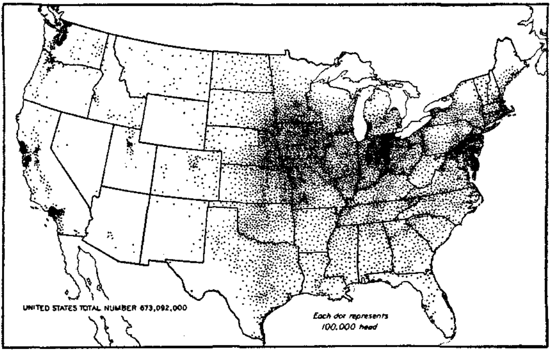


FIGURE 46.—Number of chickens raised on farms in 1929

Types of Producing Units

Three types of producing units appear prominent among the innumerable types of chicken flocks:

(1) The small flock maintained as an incidental item of the farm enterprise to produce home supplies and usually some surplus for sale.

(2) The semicommercial farm flock, handled as a major item of the farm enterprise, producing poultry and eggs as cash crops.

(3) The highly commercialized flock, located with reference to markets rather than to feed supplies, which are mostly bought, and with limited range.

Type 1 is found in all sections. Type 2 is found throughout the country, but mainly in the general farming regions of the North Central States where grain is cheap. Type 3 is most common in the North Atlantic and Pacific Coast States, to a lesser extent in the Rocky Mountain States, and in the vicinity of interior centers of population. (Fig. 47.)

Production of Chickens

The average number of chickens raised annually during the eight years, 1924–1931, was 45 per cent greater than the numbers on hand at the beginning of those years. The total number raised in 1930 was

estimated at 667,000,000, and that in 1931 at 642,000,000. There was an increase in 1932 over the number in previous year, but the 1932 total was apparently smaller than that of 1930.

Production of chicks by commercial hatcheries, which supplied about 33 per cent of the chickens raised on farms in 1928, continued to expand rapidly up to 1930. During 1931, however, the depression caused farmers to resort to more farm hatching and the output of commercial hatcheries declined sharply. Although the number of chicks hatched in 1932 was apparently 5 to 10 per cent greater than the number hatched in 1931, there was only a slight increase that year in the output of commercial hatcheries.

Production of Eggs

Egg production in 1879, according to the census, was 109 eggs per capita. During the next 20 years the industry expanded very rapidly,

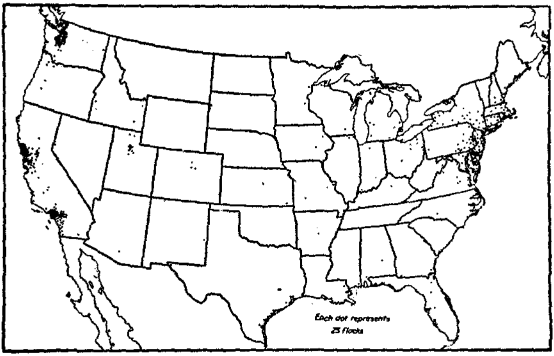


FIGURE 47.—Number of flocks of 1,000 or more chickens on farms April 1, 1930

with the result that the census of 1900 indicated a per capita production in 1899 of 204 eggs, or almost double that of 1879. By 1929, production had increased until the per capita supply was 263 eggs. Although part of this increase in output may have been the result of less complete returns in early census enumerations, there is ample evidence that poultry and egg consumption was stimulated as a result of improved handling methods. The development of the refrigerator car, which extended the area from which eggs could be sent to market, and of cold-storage warehousing, which greatly improved the quality of poultry and eggs carried from one season to another, contributed greatly to the progress in this field. Coincidentally with these improvements in handling methods, production practices also were improved, largely as a result of educational programs designed to instruct producers in applying the results of scientific investigation.

Geographic expansion in production during recent years has been largely associated with the increasing trend toward commercial egg production, which has become a highly specialized industry. The commercial flocks containing from several hundred to several thousand

hens selected for high egg production, carefully housed and fed, and handled by improved methods, were formerly located only in the sections immediately adjacent to the large markets. Later, in certain sections with favorable conditions, particularly in the far West, commercial production of high-quality eggs for shipment to distant markets became established on a large scale.

The very low prices of eggs during 1931 and 1932, with practically no reductions in rail transportation charges, were particularly unfavorable to commercial poultrymen shipping eggs to distant markets, and especially to those who at the same time were compelled to buy feed shipped in from other areas. The rapid development of motor transportation during recent years, on the other hand, has operated to the advantage of producers located in farming sections with a local supply of cheap feed, and who are at the same time within hauling radius of the larger markets.

Farm Prices of Poultry and Eggs

Since the World War period, farm-price levels of poultry products have suffered less decline than those of most farm products. Even the low prices of poultry and eggs in 1932, when compared with pre-war prices, were not so low as those of other farm commodities. The 1932 farm price of eggs was only 26 per cent less than the 5-year 1909–1914 average, whereas the 1932 farm price of chickens was about the same as the average of those years. Compared with their pre-war levels, prices of grains were down 56 per cent, those of dairy products 30 per cent, and those of meat animals 37 per cent. The relatively greater declines in feed prices were favorable to poultry and egg production.

When compared with the average prices for the five postwar years, 1923–1927, the average farm price of eggs in 1932 was down 49 per cent and that of chickens, 42 per cent. Farm prices of meat animals were lower by 51 per cent, those of dairy products, 50 per cent, and those of grains, 76 per cent. The greater relative decline in grain prices in this period also favored the production of eggs and poultry.

Poultry and Eggs in Cold Storage

The level of cold-storage holdings of shell eggs changed very little from 1916, the first year when figures for the entire United States became available, until 1922, when there was a sharp increase. During the period 1922–1931 storage stocks were maintained at a level nearly 50 per cent higher than during the earlier period. Dealers who stored eggs in 1930 and 1931, however, suffered heavy losses as a result of the rapid declines in prices that occurred before these eggs could be sold. These two unprofitable years, together with the restricted credit conditions that prevailed in the spring of 1932, caused dealers to curtail storage operations for the 1932–33 season, and total stocks of shell eggs at the beginning of the season were about equal to the average of 1916–1921.

Although storage stocks of shell eggs were maintained at a fairly uniform level from 1922 to 1931, the storage stocks of frozen eggs showed a marked upward trend during this period. Bakers, confectioners, manufacturers of mayonnaise, and those engaged in other industries requiring large amounts of eggs, have found the frozen product cheap and satisfactory.

The use of cold storage for maintaining a more even movement of poultry into consumption throughout the year has increased greatly since 1917, the year when reports on stocks of frozen poultry were first released. The volume of poultry stored annually has shown a marked upward trend since that year.

Market Receipts of Poultry and Eggs

Receipts of both poultry and eggs at the principal market centers in 1932 were considerably smaller than in 1931. These reductions in market receipts were relatively greater than the decreases in production. Apparently, the low prices for eggs and poultry, with practically no reduction in transportation costs, stimulated rural consumption and created a situation favoring the use of these products near their point

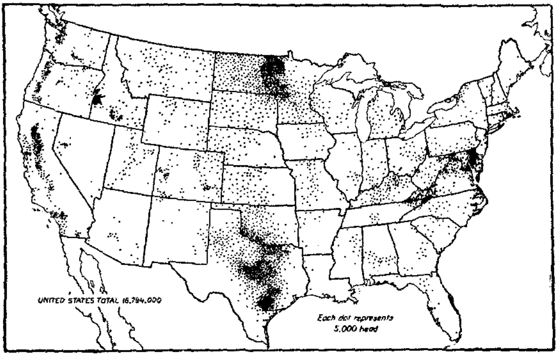


FIGURE 48.—Number of turkeys raised on farms in 1929

of origin. The apparent increase in farm consumption, with attendant decreases in market receipts, was a strengthening factor in the price of poultry and eggs in 1932.

Turkey Raising

Turkeys originated in the Western Hemisphere and are one of America's important contributions to the world's food supply. The importance of turkeys in the poultry industry was, through a long period, limited by their great susceptibility to disease. The heavy mortality among poults, especially when raised with chickens, added greatly to the expense of production. This resulted in a gradual decrease in the production of turkeys in the well-settled regions where chicken and egg production is most intensive and to a pronounced increase in those sections where grain is abundant and cheap and where the free range that favors the half-wild nature of the bird is more available. Figure 48 shows the marked concentration of the turkey industry in such regions, as shown by the census for 1929.

Turkey production for the country as a whole showed a declining trend for several years after the World War, reaching a low point in 1927. With the gradual adoption of improved methods and with profitable returns to growers, numbers have tended to increase since that year, and in 1932 the turkey crop was the largest of record, probably exceeding 19,000,000 birds. There has been a pronounced recovery during these years in the number of turkeys produced in the farming sections of the country east of the Mississippi River, as well as heavy increases in the commercial producing areas of the western half of the country, but the trend toward production of turkeys in very large flocks has probably been halted by the very low prices received for turkeys produced in 1932.

Although turkeys formerly sold for considerably more per pound than chickens, the improvement in methods of producing turkeys has lowered the cost, and the spread in price between turkeys and chickens has decreased greatly in recent years. The difference between the farm price per pound of turkeys and of chickens on November 15 was approximately 10 cents in 1926, 7 cents in 1929, 4 cents in 1931, and only 2.8 cents in 1932. The December price in 1932 was even less favorable to turkeys than that of November and in leading markets there was practically no difference in price between turkeys and chickens of similar quality.

While the prices received in 1932 will lead many turkey growers to reduce or dispose of their flocks, the very low prices for feed made it possible to produce the birds in that year at a very low price. Many experienced and efficient producers claim to have made money on their turkeys in 1932, and it is not expected that the reduction in numbers in 1933 will be very large.

Imports of turkeys have not been a large factor in the market. At the low prices prevailing in 1932 and with a tariff of 10 cents per pound for dressed turkeys, imports amounted to less than 0.25 per cent of the domestic production.

Cold-storage stocks of turkeys January 1, 1933, were almost two-thirds greater than the 5-year average. This big carry-over was partly due to the big crop, but with increasing production and lower prices the consumption of turkeys beyond the holiday season is increasing.

Samuel A. Jones, Gordon W. Sprague, *and*
Alexander Sturges,
Bureau of Agricultural Economics.

BREEDING and Management Have Greatly Increased Average Egg Production In many respects the greatest need of the poultry industry of the United States is the use of better-bred stock by farmers and commercial poultrymen. The average annual production of laying hens in the United States is only about 80 eggs. A flock average of 150 eggs per bird is readily possible if the stock has been bred to lay. With this average relatively good profits are generally made.

In recent years much attention has been given to selecting and breeding for higher egg production, a fact which has resulted in much higher average egg production not only in large commercial poultry flocks but also in the small farm and back-yard flocks. Culling out the poor layers from the laying flocks by selection based on their ap-

pearance and condition during the summer has become a very general practice where hens are not trap nested. Egg-laying contests, which were begun in the United States in 1911, are now carried on in many sections of the country. The egg production in these contests has greatly increased in the last 10 years. In the contest in Connecticut, which was the first and is fairly representative, the average production per hen increased from 160 eggs in 1921 to 213 in 1931.

A marked increase in average production is also shown in the egg records of many commercial poultry farms and general farm flocks. In New Jersey, records of a large number of commercial poultry farms showed that average yearly egg production per hen increased from 133 eggs in 1921 to 150 in 1929. Likewise, in Missouri, a selected group of general farm flocks produced an average of 147 eggs per hen in 1929 compared with 100 eggs in 1919. With higher egg production there has been some tendency toward a greater percentage of small eggs in many flocks, a tendency which has necessitated the rigid culling of all hens laying small eggs. In practically all egg-laying contests, egg size as well as number of eggs is taken into consideration, and selection for larger eggs is a very important problem in all breeding flocks. The size of an egg materially affects its market value.

This interest in higher egg production and maintenance of good size has led to the establishment of numerous large poultry-breeding farms where all layers are trap nested and pedigrees of all chicks are recorded. Selection of breeding stock is made through progeny testing. Many of the breeders are selected for high hatchability of eggs and good livability of chicks in addition to high egg production. The keeping of records of performance under official supervision has been developed in a number of States, and has aided in the breeding of poultry for better egg production. From these poultry farms, breeding stock of high-producing blood lines is getting into the commercial laying flocks and the general farm and back-yard flocks of the country.

Breeding for increased egg production requires much careful, detailed, and persistent work to show results. The health of both males and females, as well as breed type, must be maintained.

Breeding factors especially affecting production are: Early sexual maturity, intensity of production, nonbroodiness, and persistence of production. The best birds mature early, lay at a good rate, are nonbroody, and show persistence by laying well in the summer and fall. In order for hens to lay approximately 200 eggs a year, they should be hatched in the spring and commence laying at about 150 to 200 days of age. They should lay at a rate of 60 per cent from the time they commence laying until March 1; that is, each bird should lay on at least 60 per cent of the days during that time in order to be a good annual egg producer.

At the United States Animal Husbandry Experiment Farm, Beltsville, Md., it has been found that among 971 Rhode Island Reds, 477 showed broodiness and 494 showed no broodiness. The birds that were broody at times had an average egg production of 188 eggs, whereas the nonbroody birds laid an average of 205 eggs.

Birds that lay well toward the close of their first laying year are nearly always the best layers. A good method of determining the persistent producers is to note the birds that lay during August and September at the end of the first year of laying. Among 894 Rhode Island Reds at the experiment farm at Beltsville, those birds that laid the most eggs in August and September also laid the highest number dur-

ing the first year of laying. For instance, 30 birds that averaged 47 eggs during August and September laid an average of 247 eggs during their first laying year, whereas 47 birds that laid no eggs whatever in August and September had a first-year average production of only 139 eggs.

Development of the Baby-Chick Industry

The small lamp incubators that were kept on most poultry farms and on many general farms 20 years ago, have declined in popularity and use. The modern trend is toward the use of large incubators in commercial hatcheries. Most of these commercial hatcheries devote all their time to hatching chicks, although medium-sized incubators are still operated on many poultry farms where hatcheries are one branch of the business. However, farmers still have many of the small incubators which they use when they do not have ready cash to buy chicks. Large numbers of chicks, also, are hatched by hens. A partial survey of farms in 1928 showed that about 43 per cent of the chicks in this country were still hatched by the natural method.

A particular advantage of the artificial method of hatching chicks is the possibility of hatching them early so tbat pullets will mature and lay in the fall and early winter. Artificial hatching and brooding have greatly increased the proportion of early-laying pullets. Other developments in the manufacture and use of incubators have been improvements in methods of controlling the temperature, humidity, and ventilation and also the introduction of labor-saving devices for handling the eggs. The use of large, compact cabinet machines in which the hatching eggs are kept in a series of shelves, seems to be increasing more than the use of the older style of long incubators constructed as single or double tier machines.

The business of producing day-old chicks commercially began in this country about 1910, and has grown immensely. The 1930 census reported 272,403,462 baby chicks bought by farmers in 1929. This business has had a marked effect on the poultry industry and has resulted in replacing mongrel with purebred flocks, in earlier hatching of chicks, and in better-producing flocks on farms. The baby-chick industry, which at first gave most of its attention to increasing the number of chicks handled, has now reached the stage at which much more attention is given to producing better-quality chicks. Most hatcheries now get their eggs from carefully selected flocks, many of which are tested for pullorum disease. A closer cooperation between hatcheries and poultry-breeding farms offers great possibilities for continued improvement in the reproduction of the poultry flocks of the country.

Improvement in Brooding Methods

Changes in brooders have been almost as great as those in incubator equipment. Stove brooders used in portable colony houses are the most common type and are especially suited for farm flocks. A very marked increase has taken place in the use of artificial methods of brooding both chickens and turkeys on general farms. Artificial brooding enables the farmer to brood in a few flocks all the chicks hatched, and aids in producing much earlier and more uniform pullets than are obtained when the chicks are raised under hens.

It has been found that for best results in brooding there should be not more than 300 chicks in a flock. As a rule the smaller the number of

chicks per flock the higher will be the rate of growth and the lower the mortality. It has also been found that best results in brooding are obtained when each 100 chicks are allowed 50 square feet of floor space or more.

Long brooder houses heated by hot-water pipes are used on many commercial poultry farms where the chicks are started either in brooder houses without yards or having very small outside porches

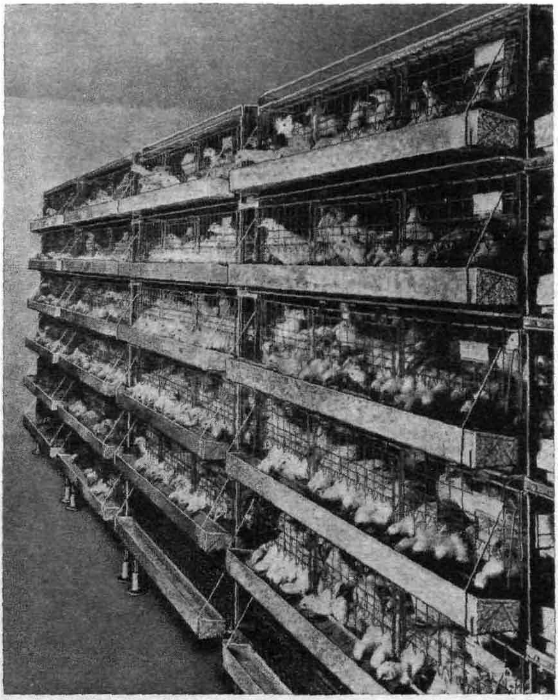


FIGURE 49.—A battery brooder, a modern device used in raising chicks for broilers and starting pullets for egg production

with wire or concrete floors. If the chicks are allowed on the ground the soil in the narrow brooder yards next to the long brooder houses soon becomes infected with disease germs and it is almost impossible to keep it sanitary. The colony brooder houses are used for growing the pullets to maturity but may be supplemented to advantage with light, portable growing shelters on range to keep the pullets from being crowded in the houses as well as to give them a better range.

The successful raising of chicks indoors has led also to a considerable use of wire-floored battery brooders in which the chicks are kept in coops five or six tiers high. These battery brooders are particularly adapted for broiler raising but are sometimes used to start chicks that are to be kept for egg production. (Fig. 49.) Best results are usually obtained when the chickens are kept not more than three to five weeks in these batteries.

Efficiency in Feeding

The quantity of feed required to grow chickens and to produce eggs depends largely on the breeding of the stock and the management of the birds. Under average conditions it takes about 6½ pounds of feed to grow Barred Plymouth Rock broilers to 10 weeks of age, when their average weight is about 2 pounds. A 2-pound Leghorn broiler will have eaten about 7 pounds of feed and will not attain this weight until it is from 11 to 12 weeks old. It takes from 25 to 35 pounds of feed to raise a pullet of the general-purpose breed to laying age, and from 20 to 25 pounds for a Leghorn pullet.

Feed costs represent from about 55 to 65 per cent of the total cost of egg production. Leghorn pullets, bred to lay, which produce an average of 150 eggs a year, require about 6 pounds of feed to produce a dozen eggs. General-purpose pullets require about 6¾ pounds of feed to produce a dozen eggs. A Leghorn hen will consume from 70 to 85 pounds of feed in a year, and a general-purpose hen from 80 to 95 pounds. Pullets are more economical egg producers than hens, and the tendency is to keep more pullets and fewer old hens on general farms. Many commercial laying flocks are made up entirely of pullets. Experience has shown that two-thirds pullets and one-third yearling and older hens is a very good proportion.

Under good conditions it takes about 3¼ pounds of grain and 5 pounds of buttermilk to produce 1 pound of gain in fattening chickens. Milk is commonly used in most fattening rations.

Improvement in methods of feeding has tended to make poultry production more economical and otherwise efficient. These improved methods have resulted largely from experimental work in poultry feeding. Many of the experiments have been conducted in laboratories where all conditions could be carefully controlled and results accurately measured. This work has gradually transformed studies of poultry feeding from a rather rough comparison of rations and of products in common use to a more fundamental study of nutritional problems.

Protein studies have revealed facts about the relative value of different protein products in egg production as well as their effect on the hatchability of eggs. These studies have produced evidence indicating that not only is the quantity of protein important but that the quality of the protein is more important in growth and egg production than it has heretofore been considered to be. The work has shown that certain vegetable proteins, such as cottonseed meal and soybean meal, although giving satisfactory egg production, are not nearly so good for producing hatchable eggs as are animal-protein feeds such as milk and fish products.

Experiments in feeding chicks have shown the need of a high-protein diet during early growth, and there is now a very general use of all-mash rations containing about 15 to 18 per cent of animal protein for the first four or five weeks. These all-mash rations are also being used

successfully for raising chickens to market or laying age as well as for feeding laying hens. However, the use of both scratch and mash feeds in the ration is better adapted to general-farm poultry raising where some home-grown grains are usually available.

Mineral and vitamin problems have proved to be as complex as the protein studies, and that of obtaining the best mineral balance for growing chickens is not yet fully solved. A ratio of about 2½ parts of calcium to 1 part of phosphorus in a growing ration has given good results where the chickens are confined indoors; but this mineral balance is apparently not important to general farmers who raise chickens on free range. The increasing tendency to keep poultry confined, either indoors or in very small, bare yards, has resulted in much greater interest in the study of minerals in the ration as well as the necessity for supplying certain vitamins in the hen's diet.

A few years ago, it was found that chickens could be kept successfully indoors, if they were fed a balanced diet supplemented by cod-liver oil. This has made it possible to raise broilers in confinement with good results as well as to keep hens confined in the laying houses, both of which practices have been extensively developed. Both vitamins A and D are very necessary in a poultry ration, but are readily supplied in yellow corn meal and cod-liver oil. This oil is commonly used in feeding chickens for the first few weeks after hatching and in feeding all poultry that are kept confined indoors. Other fish oils are used for the same purpose. There appears to be no need to feed cod-liver oil to chickens in farm flocks that have a grass range and receive plenty of direct sunlight.

The production and sale of commercially mixed poultry feeds have grown into a very large business. Many of the feed companies maintain their own well-equipped experiment farms for studying feeding problems and also do extensive work in distributing poultry information to producers.

Improved Practices in Poultry Management

The use of electric lights in poultry houses to improve fall and winter egg production has become common on poultry farms. Artificial lighting is also used to some extent for small flocks in back yards and on general farms. The extra hours of light, supplied from September to March, lengthen the pullets' working day to about 12 or 14 hours, thereby increasing egg production as a consequence of the extra feed consumed by the pullets.

Although the long, narrow poultry house is the type still most common both on general farms and on poultry farms, there is a noticeable trend toward the use of larger houses. One of the latest types of large laying houses is the multiple-story house (fig. 50), from two to six stories high, which will house from 1,000 to 5,000 hens. Large barns have been remodeled and made into very good poultry houses. The use of large poultry houses reduces labor, makes it easier to care for the hens during the winter months, and provides more comfortable quarters for the birds during cold weather. Many of these houses have well-insulated walls and mechanical systems of ventilation. Some are artificially heated. Hens are also sometimes kept in laying batteries, arranged in tiers, each hen having an individual compartment.

The use of strict sanitary measures in rearing poultry and in keeping laying and breeding stock has increased greatly in recent years. "Grow

Healthy Chicks" projects have been developed extensively in many States. Use of sanitary methods in rearing turkeys has reduced the losses from blackhead and has restored turkey raising to its former status.

A typical sanitary program of poultry raising involves the following points:

(1) Producing chicks from breeding stock free from pullorum disease and hatching them in clean incubators.

(2) Keeping brooder and laying houses clean by scrubbing the buildings and equipment with water containing lye, and then thoroughly disinfecting them.

(3) Using clean ground, that is, ground that has been entirely free from chickens and chicken droppings for one year.

(4) Keeping litter clean by frequently changing it in the laying house and by renewing it at least once a week in the brooder house.

(5) Keeping feed and water clean by using feed hoppers that prevent waste and keep out dirt, and by placing mash hoppers and water pans on raised wire screens.

Improved management likewise has contributed materially to improvement in the quality of eggs, a development that has tended to increase consumption of eggs in recent years.

Improvement in the Quality of Eggs

Figures of the 1930 census indicated a per capita egg consumption of 21.9 dozen in 1929 compared with 15.7 dozen in 1919. There is need, however, for further improvement in the methods of producing and marketing eggs on general farms.

Less improvement has taken place in the quality of poultry meat produced on farms, and there is also less opportunity to capitalize on meat quality, since eggs are the principal product of poultry raising. The value of eggs sold was three and one-half times the value of poultry sold in the States on the Pacific coast, three times that in the Mountain States, and approximately twice the value of poultry sold in the rest of the country. The farmer who keeps 200 or more hens has a unit large enough to make it worth while to use improved methods and give careful attention to the production and marketing of good-quality eggs and poultry. If a farmer is unable to keep a flock of 200 hens or more, there are many advantages in keeping only enough to produce eggs and poultry for home use.

The growing practice of buying eggs on grade from producers is giving farmers an incentive to produce and market good-quality eggs. Good size is required in eggs of the highest grade; this quality is largely controlled by breeding. Feeding materially affects the quality of eggs but only slightly affects their size.

Other important factors include the producing of clean eggs, producing infertile eggs, keeping the eggs cool, and marketing them while fresh. In order to produce clean eggs it is necessary to provide one nest for every four or five hens; to keep the nests well supplied with litter, which should be changed frequently; to place wire netting under the roosts so that the hens can not have access to the manure on the dropping boards; to keep the floor of the house well supplied with clean, dry litter; and to gather the eggs four times a day during warm weather and twice a day at other times.

Heat causes eggs to deteriorate; therefore, the farmer who wishes to market good eggs should put them in a cool place as soon as they are gathered. Fertile eggs are likely to spoil much more quickly than infertile eggs; therefore, farmers should remove the male birds from the breeding stock immediately after the breeding season is over. Eggs for market should never be washed and the dirty eggs should be kept for home use. All eggs should be marketed at least twice a week.

Eggs produced on commercial poultry farms usually bring much higher prices than those produced on general farms. However, the commercial poultry farmer also has the problem of needed improvement in egg quality and better marketing methods. The eastern poultryman, for instance, finds that he must improve his methods to compete with the excellent quality of eggs produced on the Pacific

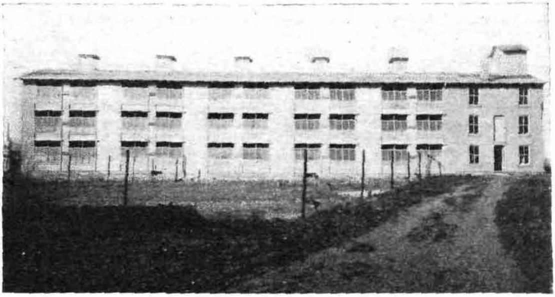


FIGURE 50.—A multiple-story poultry house. This type is now used on many farms

coast, where eggs are so carefully graded that they sometimes bring higher prices in the eastern market than do eggs produced on near-by poultry farms.

Controlling the color of egg yolk presents a problem if eggs are produced primarily for markets that pay a premium for pale yolks. Green feed and yellow corn in the ration tend to produce dark-colored yolks, whereas lack of certain green feed and the use of wheat, oats, barley, and white corn tend to produce the desired light-colored yolks.

Poultry Products in the Diet

Hens' eggs have high nutritive value, are easy to cook, and are, in general, one of the most popular foods. They are greatly valued for their high protein content, for their varied mineral elements, and for the several vitamins that they contain. The white of an egg is made up largely of protein, the yolk is rich in vitamins A, B, D, and G, and considerable quantities of calcium, iron, and phosphorus are present. Practically all the fat in eggs is contained in the yolk, but both the white and the yolk contain proteins and minerals. Besides supplying these desirable food elements, eggs properly cooked are one of the most easily digested of foods.

Although most eggs reach the consumer in the shell, the quantity of frozen eggs used by bakers and confectioners is gradually increasing.

Poultry meat has long been a favorite food although not used in the diet so frequently as eggs. Chickens make up the main source of poultry meat throughout the year except at Thanksgiving and Christmas, when turkeys are highly popular. A marked increase in winter-broiler raising in recent years has made available a good supply of freshly killed broilers at all seasons of the year. Poultry flesh, though differing but little in nutritive value from other lean meat, is greatly relished and is an efficient protein food as well as a good source of iron and phosphorus.

Though, as previously stated, chickens predominate in the poultry industry of the United States, turkeys, ducks, and geese are also commercially important.

Turkey Raising

Although most turkeys are still raised in small flocks on general farms, there are many farms, especially in the Northwestern States,

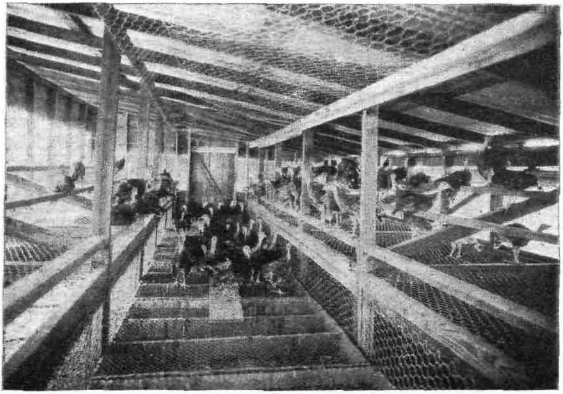


FIGURE 51.—Wire floors in a house used for growing turkeys on the range. This sanitary feature has substantially reduced mortality

where 1,000 or more turkeys are raised each year. Farmers can advantageously raise fair-sized flocks of turkeys by following careful sanitary practices in handling the stock, providing clean yards and range, brooding the poults artificially, and keeping the young turkeys away from all chickens. (Fig. 51.) Excellent results may be obtained by keeping the turkey poults in semiconfinement for the first 8 to 12 weeks and then putting the young turkeys on clean, free range where they can pick up part of their feed. The best growth is obtained when the growing turkeys are fed some growing mash even if they have an excellent range. It takes about 80 pounds of feed to raise a male turkey to 26 weeks of age, and 50 pounds for a young hen. Well-grown males, fed freely, weigh about 18 pounds at that age, and the females about 11½ pounds. Average feed consumption is about 4½ pounds for each pound of live turkey produced.

Duck Raising

Ducks raised in 1929 made up 1.6 per cent of the total poultry production in the United States. On general farms there is but little interest in ducks and the number raised there is apparently decreasing. On the other hand, interest in raising ducks on a large scale for commercial purposes is growing. This enterprise has been most extensively developed on Long Island in New York State. There are also large duck farms in other regions.

On such commercial farms ducks are forced for rapid growth and weigh 5½ pounds at 10 weeks of age, when they are ready for market. On general farms they are not forced and usually are not ready for market until about 6 to 7 months old, when they weigh only 5 to 6 pounds. Certain breeds of ducks lay as well as chickens, if bred for egg production, but since there is very little demand for duck eggs in the United States there is but little interest in keeping ducks for egg production.

Goose Raising

Goose raising, on general farms in this country, is in about the same state of development as duck raising; however, there are no large commercial goose farms, since geese are produced entirely in small flocks on general farms. Geese made up only 0.6 per cent of the total poultry raised in 1929; the number kept in this country has decreased materially in the last 20 years.

Prices received for market geese have been somewhat lower than duck prices, considerably below prices for hens, and very much lower than turkey prices. This condition appears to account for the decreasing interest in goose raising.

ALFRED R. LEE *and* MORLEY A. JULL,
Bureau of Animal Industry.

163060°—33——21

FRUITS and VEGETABLES

DECADE of Expansion Leaves Most Products Depressed; but a Few Are in Active Demand The economic situation of fruit and vegetable growers as a group continues unsatisfactory, although conditions are by no means uniform among the various subgroups of the industry. For a few commodities there has been active demand at prices that have meant at least temporary prosperity. For most fruits and vegetables exceedingly low prices have been realized for quantities that in ordinary times would not have been considered excessive.

Car-lot shipments reported by the carriers for the fiscal year ended June 30, 1931, totaled 1,110,222; for the fiscal year ended June 30, 1932, they were 953,809—a decrease of 156,413 carloads. There appears to be some evidence, however, that the movement direct from the farm or packing house to market by motor truck has continued to increase and that redistribution from the principal markets is more largely by motor truck and less frequently by rail than a few years ago. It appears likely therefore that there has been no material decrease, if any, in the total tonnage of fruits and vegetables shipped to market, although there has been a decrease in the recorded car-lot movement from many important producing sections where the fruit and vegetable crops are major items in the income of the community.

Prevailing prices for many products have made it impossible to realize freight and marketing costs for the lower grades when shipped over long distances. On the other hand, there has been an almost unprecedented demand for No. 2 potatoes from the Southeastern States where the freight rate would permit the movement of these low-grade goods to consuming centers for sale at a price a little above cost. Thus specific instances can be cited to show that groups within the industry have felt the stimulating as well as the depressing effect of the general business situation.

Home Gardens

Much has been said and written about the "back-to-the-farm" movement and the impetus to home gardens and to community gardens during the period of unemployment or reduced income. Nothing short of a complete census would reveal the extent of this movement. The facts at hand, supplemented by observations of the department's representatives made incidentally to their regular duties, seem to justify the statement that during the last year there has been an immense increase in private families' production of vegetables, primarily for their own use.

Many producers of cotton, of cereal grains, and of livestock or livestock products have measurably improved their economic position within the last year by increasing the proportion of the family food produced on the place, largely in the form of annual vegetable crops. At the same time, there has been an increase in the number of farms not primarily devoted to fruits and vegetables but on which some surplus products of this kind are produced for sale, often at roadside stands or to traveling hucksters.

Fertilizers

Within the last year commercial fertilizers have been obtainable by many farmers at lower prices than ever before. This has been especially true in regions of heavy commercial production and where the consumption of fertilizer is normally heavy. The availability and low price of fertilizers have unquestionably contributed to the success of the home-gardening movement. At the same time, the reduction in fertilizer prices has reduced the cost of commercial production and has helped to maintain truck-crop acreage at a point that insures the public against any scarcity of these products. Fertilizers are one of the large items of expense in commercial vegetable production in almost all humid districts and are increasingly used on fruit and vegetable crops grown under irrigation. Any reduction in the cost of fertilizer per unit of plant food lessens the investment per acre in the production of these crops. Reduced fertilizer prices and the reduced wage scale have, therefore, tended to maintain the volume of commercial production in the face of falling prices.

Financing by Dealers

The tendency of those persons who produce vegetables on a large scale, to depend on their dealers or marketing agents for the capital necessary to finance their annual operations, appears to be growing rather than decreasing. Bankers have naturally been even less inclined than in former years to lend money for commercial production. Probably few growers have been able to continue their former scale of operations on their own resources. Prices so much lower than those to which growers have become accustomed and the prevailing uncertainty as to the probable course of the general level of agricultural prices have had a tendency to make the grower unwilling to plant vegetable crops on a large scale unless under some form of contract with a buyer or distributor. Such a contract makes the grower feel that his risk is being shared and that a competent marketing agency is assuming the responsibility for securing whatever return his product may be worth when harvested.

In the principal districts of surplus production it appears to be more and more the case that the total acreage annually planted depends upon the amount of money that distributors are willing to advance for production uses.

Trends in the Fruit and Vegetable Industries

It seems obvious that the importance of fruits and vegetables in the national diet during the last decade has been increasing at a tremendous rate. As a direct result, production of many of the individual

crops has been greatly expanded. To get a clear picture of the trends in the production and volume of these commodities, however, it is necessary to study them combined into homogeneous groups. This may be done by constructing indexes of production, prices, and total volume of the several crops combined into homogeneous groups. The following discussion is based on the facts revealed from an analysis of the several indexes of the various groups. The crops are grouped on the basis of their economic relationships and importance. The groups include (1) all major fruits, (2) commercial vegetables excluding potatoes and sweetpotatoes, (3) potatoes, and (4) sweetpotatoes.

Fruits

Production of all fruits in the United States during the last decade has been ample to meet all demands. From 1921 to 1931 there was a 23.5 per cent increase in the level of the production of all fruits, the index rising from about 89.5 in 1921 to about 110.5 in 1931. The production of apples has declined during this period whereas that of peaches and pears has increased. In addition, citrus fruits and a great many of the small fruits increased tremendously. It is evident that more fruits are being consumed now than 10 years ago. As compared with the 1924–1929 average, the production of all fruits was 12 per cent and 17 per cent greater in 1930 and 1931, respectively. The December estimates of the Crop Reporting Board, however, indicated a fruit crop for 1932 only 2 per cent greater than the average. In 1930 fruit prices to growers averaged 15 per cent lower and in 1931 averaged 30 per cent lower, owing mostly to the decline in consumer purchasing power.

Although fruit production and prices have varied from year to year it is evident that when consumer purchasing power in the country was stable the total value of production did not vary. The inference then is that fruit growers in general find the total value of their crops more dependent upon the purchasing power of consumers, together with the general level of price influences, than upon the size of the crops. From 1921 to 1931 the total value of fruits produced in the United States varied directly with the changes in consumer purchasing power, irrespective of the volume of production. During the period 1924–1929 consumer purchasing power was very stable and so was the total value of fruit production. But in 1929, 1930, and 1931 consumer incomes declined to low levels and so did total fruit-crop values. In 1930 the total value of the fruit crops was 17 per cent less than the 1924–1929 average, whereas in 1931 it was 30 per cent less. Consumer purchasing power as measured by the Federal Reserve Board's index of factory pay rolls was 19 per cent lower in 1930 and 39 per cent lower in 1931 than it was during the base period 1923–1925. During the first half of 1932 this index averaged 52 per cent lower and for the entire year it is estimated to have averaged 55 per cent lower, which indicates a total value of the 1932 fruit crops approximately 45 per cent less than the 1924–1929 average.

The Export Situation

Exports of fruit and fruit products during 1931–32 (July to June) declined in both volume and value from those of the preceding year. Exports of fruit in 1931–32 amounted to about 1,044,000 short tons and were valued at $91,700,000, against 1,195,000 short tons and a

value of $120,600,000 in 1930–31. Fruit shipments made up 12 per cent of the total agricultural exports of $752,000,000 in 1931–32 and were exceeded in value only by cotton and by grain products. Of the $91,700,000 worth of fruit exported in 1931–32, fresh fruits made up 51 per cent, dried fruits 28 per cent, and canned fruits 21 per cent. Fresh apples were the most important of the fruits exported, accounting for almost one-third of the total. Other important fruits were fresh pears, oranges, and grapefruit; dried prunes and raisins; and canned pears, peaches, salad fruits, apricots, and pineapples.

A large part of the production of some of the leading fruits is exported. In the 5-year period 1926–27 to 1930–31, about 51 per cent of the dried prunes, 33½ per cent of the raisins, 17 per cent of the fresh apples, 7 per cent of the pears, 8½ per cent of the oranges, and 7 per cent of the grapefruit produced in this country were exported. Any restriction of the foreign outlet unfavorably affects, either directly or indirectly, the prices of fruit sold in the domestic market.

During the 1931–32 season many factors hindered the free flow of commodities. Fruit, particularly apples, has been especially hard hit. Prices in world markets continued to decline and purchasing power was further reduced as a result of the world-wide depression. Many foreign countries have sought to increase the protection to their fruit industries by means of higher import duties, quotas, and sanitary regulations. In addition, foreign purchases have in a number of cases been restricted by the scarcity of exchange. Particularly important from the point of view of fruit exports from the United States have been the increased duties in the United Kingdom and Canada, quotas and sanitary regulations in France, and currency restrictions in Germany.

The fruit industries in the various importing countries not only have been encouraged by these import restrictions but have been given direct government assistance in improving the quality and pack of their fruit. Growers are being supplied with expert advice on selecting planting stock and on cultural practices. Official grades and standards are being adopted. Modern packing plants have been erected. Similar steps have been taken in the principal exporting countries that compete with the United States in foreign fruit markets. The results of these measures are already being shown in an improvement in the quality, grade, and pack of foreign fruit competing with United States fruit in foreign countries. This growing competition is making it increasingly necessary for American fruit growers and shippers to offer a product of high quality in the foreign markets.

Differences between the Fruit and Vegetable Situations

The orchard is a long-time investment and the cost of the apple crop produced in 1932 is not to be measured by the expenditures of the orchardists during that year. The orchard can not be abandoned nor its care and culture wholly omitted from the program of the year, simply because it fails to bear a crop or because it is foreseen that the crop is unlikely to return even the operating cost of the season. The effect of a period of low prices on the production of orchard fruits will not, therefore, be wholly apparent at the moment. Unprofitable returns season after season make it progressively more difficult for the orchardist to finance his annual operations and to continue to hold title to his real estate. His applications of commercial fertilizer or of water for irrigation may be curtailed. Pruning, spraying, and thinning may be

less effectively done or possibly omitted altogether. The orchard may suffer only a temporary injury or it may be seriously and permanently damaged. The effect in the latter case will be felt through many years.

Since most fruit crops vary widely from year to year in their volume of production as the rainfall and temperature in specific districts are more or less favorable, it is impossible even to estimate at this time the extent to which the orchards of the country are being injured by the neglect from which many of them are necessarily suffering. If low prices coupled with crop failures result in the neglect of commercial orchards for 2 or 3 years the results are not likely to be overcome within less than 8 or 10 years from the beginning of the period of recovery.

The present situation suggests that commercial fruit production as an exclusive means of livelihood should not be undertaken by the producer with limited means. He will be unable to survive successive seasons during which either economic or climatic conditions may make it impossible for him to recover his annual operating costs.

Commercial Vegetables

The volume of production of commercial vegetables has risen about 72 per cent in the last 10 years. The index of production of commercial vegetables rose sharply from 1921 to 1925, declined somewhat in 1926, and again increased through 1930. In 1931 there was a decline in production to below the 1929 volume, with 1932 production remaining at the 1931 level. During recent years the trend of commercial vegetable production has been rising at a decreasing rate, which indicates that supplies are fast overtaking the increased demand.

In contrast to production, prices of vegetables have followed a downward trend since 1921. Prices have varied indirectly with production, with prices during 1930, 1931, and 1932 declining to much lower levels than the size of the respective crops in these years would ordinarily have warranted. In short, prices for commercial vegetables averaged 6 per cent lower during 1930 and 23 per cent lower during 1931 than what would probably have been received for these supplies in normal times. These declines in prices may be attributed to the marked decline in the general level of prices.

During the period 1920–1929 the total value of commercial vegetable crops varied directly with production. As production increased, the total value increased and vice versa. This influence of production upon total value is in contrast with the relation of fruit production to total value. In 1921 vegetable production was very small and so was the total value of the crop. During most of the following 10 years there were increases in the volume of production and in the total value. The increase in production continued through 1930 but the business depression and the attending decline in the general price level brought about a decline in the total value of vegetable crops to slightly below that of the 1929 season. In 1931 there was a 10 per cent decrease in production and a 22 per cent decrease in total value. On the basis of the relationship existing between total value and production during the last decade, an 11 per cent decline in total value in 1930 and a 24 per cent decline in 1931 may be attributed to the depression. The 1932 commercial vegetable production was slightly larger than the 1931 crop but, with the continued decline in the general price level, total value was somewhat smaller.

Potatoes

Potato production in the United States has fluctuated widely from year to year during the last decade, but there has been no definite upward or downward trend. There have been marked shifts among the different areas but for the country as a whole potato production during the last few years remained at about the level of 10 years ago. Potato prices, likewise, have varied widely in the last decade but, excluding the recent depression years, they show no definite upward or downward trend. During the years of comparatively stable commodity prices, potato prices varied inversely with production.

Production of potatoes was low in 1929 and 1930 (about 330,000,000 bushels) but it increased in 1931 to 376,000,000 bushels or about an average crop. The 1932 crop was 357,000,000 bushels. On the basis of the normal relationship between prices and supplies, potato prices should have been only slightly lower in 1930 than in 1929, but because of the depression and the decline in the general price level, they were 30 per cent lower. In other words, the abnormal demand situation existing since 1929 caused a decline of 25 per cent and 40 per cent, respectively, in the 1930 and 1931 average of potato prices in the United States.

In contrast with the relation of total value to production in the case of commercial vegetables, there is considerable evidence that the value of the potato crop has varied inversely with the volume of production during the last 10 years or more. The years of large production were associated with years of small value and vice versa. The small 1925 potato crop had the greatest value of any of the last 10 years. During the following three years potato production was increased and total value decreased. In 1929 production was decreased markedly and total value was increased. The 1930 and 1931 crops were successively increased and total value decreased. During the last two years, in addition, total value was reduced 25 per cent and 40 per cent, respectively, by the decline in the general level of prices. The total value of the 1931 crop was the smallest of the last decade. There was a slight decrease in production in 1932 but the lower level of commodity prices may cause a further decrease in the total value of the crop.

Sweetpotatoes

During the last decade there has been a slight downward trend in the production of sweetpotatoes in the United States. Since 1922, production has gone through two complete 5-year cycles and again reached a peak in 1932. The estimates of the Crop Reporting Board placed the 1932 production at 76,000,000 bushels or almost a record crop, compared with 63,000,000 bushels in 1931 and 54,000,000 bushels in 1929.

Sweetpotato prices have trended downward in recent years. They have varied inversely with production except when the production of potatoes was extremely small or large. In 1925 the potato crop was exceptionally small and prices were comparatively high; this situation increased the demand for sweetpotatoes which, in turn, raised prices. The reversed situation occurred in 1922 and 1928. In 1930 and 1931 the decline in the general price level caused an abnormal decrease in the price of sweetpotatoes.

The relation of total value to production of sweetpotatoes is similar to that existing with commercial vegetables. During the last decade

the total value of sweetpotatoes varied directly with the number of bushels produced. In addition, however, total value was influenced by the value of potatoes and the general price level. In 1930 and 1931 the decline in the general price level and the reduction of consumer incomes caused an abnormal decrease in the total value of the sweetpotato crop. Production was relatively small in these two years and this, coupled with falling prices, reduced the total value of these crops to the lowest of the last 10 years. Declines in total value of 19 per cent and 43 per cent, respectively, in 1930 and 1931 may be attributed to the depression. The 1932 production is almost a record crop but with commodity prices in general at a still lower level the total value of this year's crop may not exceed that of the 1931 crop.

Responsiveness to Demand

The present economic situation in the commercial vegetable industries differs in many respects from that in the commercial fruit industries. The latter, as has been indicated, are likely to feel for several years the injurious results of such neglect as is almost inevitable during a prolonged period of unprofitable returns. On the other hand, the production of annually planted vegetable crops can be made to respond quickly to either present or prospective demand. Vegetable production can and should adjust itself more quickly and effectively to the prevailing economic situation than it is possible for the orchard industries to do.

WELLS A. SHERMAN, G. BURMEISTER, *and* A. C. EDWARDS,
Bureau of Agricultrual Economics.

CITRUS Growers Try Out New Varieties as Supply of Standard Sorts Mounts

The greatest single factor affecting the production of citrus fruits in recent years has been the rapidly increasing crop produced in the Rio Grande Valley of Texas, consisting chiefly of grapefruit. From a few thousand boxes produced 10 years ago the output reached about two and one-half million boxes during the 1931–32 season. The Texas crop matures about the same time as the Florida and Puerto Rican crops and coincides fairly closely with the heaviest movement of California-grown Washington Navel oranges. This development, with the increased production in Florida and some increase in California and Arizona, has greatly increased the total available supplies of grapefruit in the United States.

The acreage devoted to oranges and lemons in California is not changing greatly. Varieties of oranges, lemons, and grapefruit produced in that section, while limited in number, are peculiarly well adapted to the needs of the industry and are of excellent quality. Practically the entire orange acreage is planted to Valencia, the orange marketed during the summer, and the Washington Navel, the California winter orange. Grapefruit is almost exclusively the Marsh variety, while lemon production is mainly confined to the Eureka and Lisbon varieties. These varieties are so well adapted to the needs of the industry that it is questionable whether others will replace them for many years to come.

The heavy production of the standard citrus fruits during recent years has focused attention on citrus varieties that come to maturity

when the supply of standard sorts is least abundant. In the Gulf Coast States from Florida to Louisiana the Satsuma type of orange has become a factor of potential importance because it matures in the fall, months before the heavy movement of oranges from Florida starts. The Satsuma orange is often confused with the tangerine because of its free-peeling rind. It is, however, much earlier in maturity, is seedless, sweet, and of low acidity as compared with the tangerine. It succeeds best in the regions near the northern limit of citrus culture, where, despite its hardiness, Satsuma orchards have been severely injured by periodic freezes during the past decade. The recent recognition of the need for frost protection should aid in stabilizing the satsuma industry in this section.

An early maturing variety of the Satsuma group, the Wase, introduced from Japan by the department, has special promise for growing in the Gulf coast region. This variety matures two to four weeks earlier than the standard or Owari Satsuma, making shipments possible throughout October when the market supply of oranges is at the minimum. Although regarded as a dwarf variety in Japan, the Wase has proved as vigorous and productive as the Owari Satsuma in the Gulf coast region. The fruit is of excellent quality if picked as soon as mature but loses quality if held after this stage. The crop of Wase Satsumas should therefore be disposed of before the main crop of Owari is ready for market. The entire Satsuma crop should normally be marketed by late November before the heavy movement of tangerines from Florida starts. The Silverhill, another variety of Satsuma originated by the department, has shown marked resistance to cold and great vigor of growth, producing fruits of larger size than the standard Owari variety and maturing about the same time. The larger size of the fruits, together with its rapid growth and resistance to cold, makes the Silverhill a promising addition to fall-maturing citrus varieties.

Another new group of citrus fruits introduced by the United States Department of Agriculture is the tangelos, hybrids between the tangerine and the grapefruit. These fruits are distinctive in appearance and flavor, resembling neither parent very closely; they are more like highly flavored oranges of unusual and attractive appearance. While tangelos have been known and grown in Florida for more than 20 years, it is only recently that a series of varieties has been originated and introduced, covering in their range of maturity practically the whole shipping season. As a class they are characterized by high color derived from the tangerine parent, though they are not so free peeling as the tangerine. They have a distinct flavor that must be tasted to be appreciated. This flavor is so attractive that the use of tangelo juice in fruit punches and other fruit drinks is growing in popularity.

One of the best tangelos, the Thornton, has fruits so tender when fully ripe that they do not readily endure the handling to which citrus fruits are subjected in commercial packing houses. Such fruit must be graded, cleaned, and packed by hand. This practice can prove profitable only with fruits that command a premium over standard varieties. The culture of fruits of this character offers an attractive field for the winter resident of Florida and other subtropical regions of the country. For the home fruit garden and for local market these tangelos have a strong appeal. While the tenderness of the flesh of some tangelo varieties may preclude large commercial developments

in them, they are particularly satisfactory for local markets or for specialized markets where they can be shipped direct from the producer to the customer.

Lemon Growing

Lemon growing in the United States is confined almost entirely to California. Growing lemons and preparing them for the market is a highly specialized task as compared with growing oranges or grapefruit and is climatically restricted to irrigated, semiarid regions with mild winter temperatures.

An outstanding problem in lemon production is to obtain heavier crops of lemons that reach marketable condition during the late summer from July until October. At present the main crop, particularly in the interior valleys of California, must be picked during the spring, while the greatest demand is during the hot periods of midsummer and late summer. Intensive investigations have been started by the Department of Agriculture into the factors that influence production of the late-summer lemon crop and to determine whether it is possible to modify practices in order to increase production during that period. Modification of the moisture supply as well as thinning practices are being tried in order to secure a more equitable seasonal distribution of the lemon harvest.

Commercial-scale lemon production has never been a success in humid regions such as Florida, and lemons even for home use are often lacking there. On the other hand, the small acid lime, variously known as the Mexican or West Indian lime, succeeds well in the warmer portions of Florida. The demand however is too limited to warrant any large extension of the lime industry especially in view of competition with limes shipped in from the West Indies.

A seedless lime known as the Tahiti or Persian lime is being planted to some extent in Florida as a lemon substitute. It is about the same shape and size as the commercial varieties of lemon and is immune to some of the diseases to which the lemon is subject in humid climates. It is usually shipped green because of the poor keeping quality of the ripe fruit. In the trade it is often called the "green lime."

A hybrid between the Genoa lemon and the Mexican lime, called the Perrine lemon, has recently been developed by the department and introduced for culture in warm humid regions. It promises to furnish at least a local source of lemons during most of the year. It has thus far proved immune to two serious diseases—lime withertip and citrus scab. The fruit is lemonlike and does not tend to become oversized as do commercial lemon varieties under Florida conditions. It is decidedly hardier than the lime but for safe culture is adapted only to the warmer parts of Florida and possibly the extreme south of Texas.

For colder regions in the Gulf States a hardy lemon introduced from China by the department is receiving favorable attention. This lemon, known as Meyer after the explorer who discovered it, is somewhat larger and of different texture and flavor from the common lemon but is well suited to home use and to local market demands.

Other hardy disease-resistant lemon and lime substitutes developed by the Department of Agriculture are being planted in home fruit gardens through the Gulf States to meet local needs. The Eustis limequat, a hybrid between the lime and the kumquat, is the best known of these hybrids and is in effect a small hardy lime capable of being grown in regions much too cold for true limes or lemons.

A promising beginning has been made in California, Florida, and Puerto Rico in growing the citron, which resembles a large coarse lemon with very thick rind. It is largely used in the candied form in fruit cake and other culinary products. The annual imports into the United States in candied form and in brine, chiefly from Italy, Corsica, and Greece, amount to about 6,000,000 pounds. It has been demonstrated that fruit of satisfactory quality can be grown in the United States, but the ultimate success of this new enterprise will depend on economy in production.

Among standard citrus varieties there has been a marked tendency for bud mutations to occur. Many of these mutations or variations are undesirable from the standpoint of commercial production, whereas a few represent possible improvements in the varieties. Under the leadership of the department, the many trees of undesirable type have been eliminated from the citrus orchards of California. At present special care is being exercised in selecting bud wood from which citrus trees are propagated, in order to secure only trees representing the best types of the different varieties.

The extensive development of a canning industry using citrus fruits has, in a measure, helped to stabilize the citrus market despite increasing production. The favorable reception of canned grapefruit has made it possible to withdraw from the fresh-fruit market a large volume of second-grade fruit, sound but undesirable because of off size or rind blemishes. The canning and freezing of orange juice, while smaller in volume than the canned-grapefruit industry, is gradually increasing, and promises to provide an outlet for an appreciable portion of the crop. The lemon industry in particular has benefited by researches leading to the utilization of nearly all off-grade fruit in the preparation of various by-products such as citrate of lime, pectin, and lemon oil.

The development of an export trade in grapefruit offers a possible means of averting domestic overproduction, and good progress has been made in the export field. The California crop maturing in the summer along with the Valencia orange supplements the Florida and Texas exports, making American grapefruit available in European countries at all seasons. Owing to economic conditions in Europe and growing competition with grapefruit grown in other parts of the world, this outlet can not be expected to absorb any very large increment in the domestic crop that may occur within the next few years.

T. Ralph Robinson *and* A. D. Shamel,
Bureau of Plant Industry.

FRUIT and Nut Industries Show Decided Trend Toward Higher-Quality Production

During the last decade there has been a fairly definite trend toward the production of higher-quality products in the commerical fruit and nut industries of the United States. It has been recognized that the total production of such crops as apples, prunes, peaches, oranges, and small fruits is sufficiently high to meet the commercial requirements of the United States and in most cases to leave a considerable surplus for export. In view of the changing conditions of national markets there has been an effort on the part of the industries concerned to produce crops of the highest possible quality, even in some cases at the expense of quantity. This change is being accomplished in

part by planting the highest-quality varieties and in part through the improvement of orchard operations. Change in varieties of orchard fruits and nuts is of necessity a very slow process, due to the many years through which production from a single tree may be expected. On the other hand, quality may be improved rather rapidly by improving production practices.

The research program of the United States Department of Agriculture is designed to assist the industries in both of these respects. Efforts to secure improved varieties include world exploration to discover promising sorts, plant breeding to develop new varieties, and selecting and testing mutations or buds sports that may represent improvement in existing kinds. The research also deals with orchard or vineyard methods that will produce fruit of the highest possible quality from varieties now in use.

The Apple Industry

The tendency to eliminate apple varieties of poor quality from commercial orchards has been very marked in recent years. In the Pacific Northwest the result has been that not more than seven varieties constitute most of the commercial crop. These varieties are Winesap, Delicious, Jonathan, Rome Beauty, Yellow Newtown, Stayman Winesap, and Esopus Spitzenburg—all of good to very high quality. During recent years planting of the Delicious has been more extensive than of all other varieties combined, and at present there are more trees of this variety than of any other in the Pacific Northwest, although the Winesap still leads in number of bearing trees. In New York and New England recent plantings have been largely of McIntosh, with some of Northern Spy, Rhode Island Greening, Baldwin, Delicious, and a few other varieties. In the great Shenandoah-Potomac-Cumberland apple area, York Imperial, Delicious, Rome Beauty, and Stayman Winesap dominate the new plantings. In plantings made during recent years the red strains of certain of these varieties, which have been discovered as bud mutations, have been substitued to a considerable extent for the standard varieties both in the Pacific Northwest and in the Eastern States. The varieties now being planted will definitely improve the average quality of the American commercial apple crop.

Not only are improved varieties being planted, but orchard-management practices that will result in better size, color, and dessert quality are being developed, and better handling methods are being adopted in order to insure that the apples reach the consumer in the best possible conditions.

Of primary importance in improving quality is the systematic thinning of crops to prevent overbearing. The research program of the department is establishing a definite basis for commercial fruit-thinning practice. It has established the fact that, in most varieties, 30 to 40 good leaves per apple are required to produce fruit of good dessert quality, maximum color, and the most desirable commercial size. This research has emphasized the importance of large leaf area per tree, which is determined by the growth conditions in the tree. Stimulating growth by applying nitrogenous fertilizers, by maintaining abundant organic matter in the soil, and by conserving available soil moisture, or adding water is essential in developing a large leaf system. The development of such a foliage system, and adjusting the fruit crop to foliage through fruit thinning, will result in moderate, regular production of high-quality fruit.

The Pear Industry

Most of the pear production of the United States is in the three Pacific Coast States—California, Oregon, and Washington. There the Bartlett variety predominates, constituting more than three-quarters of all production. This variety is unsurpassed as a fresh market pear during its season and also constitutes practically all of the Pacific coast canned-pear output. During recent years there has been an increased production of such varieties as Anjou, Bosc, and Winter Nelis, particularly in Oregon and Washington.

In the Eastern States also, the Bartlett is an important variety in the northern pear districts, including New York and Michigan. Because of its greater resistance to the pear-blight disease, however, the Kieffer variety predominates in the eastern plantings, in spite of the fact that at best it is of only mediocre quality. A systematic search and breeding program is under way to obtain for the Eastern States pear varieties of improved dessert quality that will have the blight resistance of the Kieffer.

Since all of the pears on the Pacific coast are produced either under irrigation or under conditions requiring thorough conservation of soil moisture from winter rains, a study of the response of the pear to various moisture conditions has recently been undertaken. This work is being correlated with soil-management practices including production of cover crops and orchard fertilization and with pruning and thinning, to determine the most important factors in the regular production of good-quality fruit.

The Peach Industry

The peach industry of all States except California is primarily based on varieties intended for the fresh market or for home canning. At present the Elberta variety predominates in all these States. While not of the highest quality, it has held its place because of its excellent production record, its good shipping quality, and its attractive blush color and yellow flesh.

In California peach production is dominated by the great canning and drying industries. For canning, the firm, yellow-fleshed, cling varieties are used almost exclusively. For drying, freestone varieties of fairly firm texture that will give a clear yellow dried product are used.

Extensive breeding investigations to obtain improved varieties, both of canning and market type peaches, are under way in the department as well as at a number of State experiment stations including particularly New Jersey, New York, and Michigan. Some very promising new varieties have been developed as a result of these investigations and are now under commercial trial. Systematic searches for bud mutations that may be valuable are also in progress. Mutations of the higher-quality canning varieties, ripening earlier or later than the variety from which they originated and which may thus prolong the harvesting and canning season for these varieties have been discovered and are being tested.

Of outstanding importance, particularly to the eastern peach industry, are investigations dealing with the relation between the amount of foliage and the size and quality of the fruit. This work provides a scientific basis for many orchard practices, including soil management

and fruit thinning. The relation of moisture supply to the functioning of the peach tree is also being critically studied. The relation of winter temperatures and winter dormancy to the growth and production of peach varieties, which is of tremendous importance along the southern border of the peach belt, both on the Pacific coast and in the Eastern States, is being investigated. The importance of this relation was emphasized in 1932 by the almost complete failure of the peach crop in the southern part of the eastern peach belt because of the extremely mild winter of 1931–32 and the extreme drought during the growing season of 1931.

The Grape Industry

The commercial grape industry of the United States remains centered in California, where approximately 90 per cent of the commercial crop is produced. This production is entirely of the vinifera-type varieties. Of basic importance to the maintenance of the industry in that State is the determination of the most satisfactory of the rootstocks that are resistant to phylloxera or root louse of the grape. The department is studying the behavior, under California conditions, of the many phylloxera-resistant rootstocks that have been developed in various parts of the world. The establishment of vineyards on rootstocks resistant to phylloxera is essential to the maintenance of vinifera-variety production, particularly on the heavier soil types throughout the State.

It is also of increasing importance in California to obtain a rootstock that is resistant to nematodes. Nematode infestation is very general on the lighter, sandier soil types throughout most of the State. Present indications are that successful grape production on these types of soils will require the use of rootstocks resistant to nematodes. Intensive investigations on this line are under way.

During the last few years there has been a wide interest in California in producing grapes of high quality to be eaten fresh. A moderate production of grapes of superior size is of primary importance for this purpose. Investigations on the effect of cluster thinning and of girdling the canes to obtain superior-quality grapes are under way. As a result of investigations the practice of thinning such table varieties as Sultanina (Thompson Seedless) is rapidly increasing among commercial growers.

During recent years the Sultanina has become an extremely important variety for shipment as a table grape. Its great popularity in its season has emphasized the desire of the consuming public for good-quality seedless varieties for fresh consumption. An extensive breeding program now under way in the Bureau of Plant Industry experimental vineyard at Fresno, Calif., is directed largely toward obtaining high-quality seedless varieties.

In the Eastern States the Concord grape still predominates. Many other varieties, however, appear to be worthy of extensive trial. In the experiments conducted in the department's vineyard at the Arlington Experiment Farm, near Rosslyn, Va., the following varieties, in addition to those commonly grown, have been of outstanding merit:

Red varieties in the order of their ripening: Captivator, Caco, Dunkirk, Oriental.

Blue varieties: Banner, Fredonia, Goff.

White varieties: Portland, Ontario, Krause.

These varieties seem particularly worthy of trial in sections near the latitude of Washington, D. C.

In the Southeast the Muscadine varieties are the only grapes that have proved long-lived. Most varieties of the bunch type of American grapes produce only one or two crops before the vines die. It is believed that this is primarily because of root troubles. Investigations have been started during the last year to establish the adaptability of different rootstocks to these growing conditions and to test the production of grape varieties on these rootstocks.

Strawberries

Because of the relatively short life of a strawberry planting, which from a practical standpoint ranges from one year in the extreme South

Figure 52.—The Blakemore strawberry, introduced in 1930 and already an important shipping and preserving variety in the South. The plant here shown was grown at Willard, N. C., where the variety was first grown commercially

to a maximum of about five years in the northern districts, the change in varieties of this fruit may be very rapid. Some modification of varieties being planted is occurring at present.

In the region from the Potomac, Ohio, and Missouri Rivers southward there has been an increased planting of the Blakemore during the last two years. (Fig. 52.) This strawberry originated as a result of breeding work done by the department. It was introduced in 1930 and is rapidly taking its place as an important variety. In the Pacific Northwest the Corvallis, a new variety produced by the Oregon experiment station, and the Redheart, produced by this department, are

being tested as canning varieties to replace the Ettersburg 121. Fairfax and Dorsett are additional new varieties being introduced by the department this year which are of exceptionally high quality and are expected to prove of value for the central strawberry districts.

One great need of all strawberry districts is improved varieties. Varieties with high dessert quality and resistance to diseases are of primary importance. The research of the department in strawberry production is largely directed toward obtaining varieties adaptable to the needs of the various strawberry districts, and combining the characteristic of producing high-quality fruit with reasonable disease resistance.

Raspberries

In raspberry production also there has been a marked change in varieties during recent years. In the Eastern States the Latham, produced by the Minnesota experiment station, has been largely used to replace other varieties of red raspberry because of its hardiness and productiveness. Several additional outstanding varieties obtained from abroad and in the breeding work of different experiment stations in the United States, are being tested. These include Chief, Lloyd George, Viking, and Newburgh. The Cuthbert is still used almost exclusively in the Pacific Northwest because of its excellence for canning, freezing, and fresh shipment.

Blackberries

An outstanding development in the blackberry industry has been the rapid adoption of the Young trailing blackberry or dewberry. This variety, originated by B. M. Young in Louisiana, was first called to public attention by this department. It is primarily adapted to the Southern States, including California, and is far superior in dessert quality to other varieties adapted to the warmer sections of the United States. The Brainard blackberry, originated and recently introduced by the department, is a high-quality, very productive variety adapted to the Central Eastern States.

The Nut Industry

The principal commercial nut production in the United States consists at present of pecan production throughout the southern section of the country; Persian (English) walnut production, primarily in California and to a smaller extent in Oregon; almond production, commercially confined to California; and filbert production, largely centered in western Oregon and western Washington. In addition to this commercial production, large quantities of black walnuts are harvested from the wild throughout the Central and Eastern States. After cracking, the meats are sold.

Pecans

The pecan industry is divided into two rather distinct regions. In the Southeastern States, including primarily States east of the Mississippi River, extensive plantings of improved or so-called paper-shelled varieties have been made during the last 30 years. In the past these varieties have been marketed almost entirely in the shell and a premium has been paid for large-sized, thin-shelled kinds.

163050°—33——22

Westward from the Mississippi River Valley, in a territory including particularly the valleys of central and eastern Texas, Oklahoma, Arkansas, and Louisiana, the pecan is an important native forest tree. Millions of these trees are growing in those States, chiefly along the river bottoms, and yield great quantities of nuts each year. At present the nuts are largely cracked before being sold, and appear on the market in the form of pecan meats. Many of these native pecan groves receive some care. Competing trees of other species have in many cases been removed and the stand of pecan trees thinned to obtain better production from those remaining. There is also wide interest in top-working some of the native trees to improved varieties in order to obtain nuts with superior quality. A considerable number of orchards of improved varieties are being established through the planting of young trees in the territory west of the Mississippi River. It is the present belief, both in the eastern and the western pecan districts, that in the future an increasing proportion of the pecan crop will be sold as meats. For this reason the industry is anxious to obtain improved varieties of nuts that will be prolific bearers and that will excel in cracking quality. Specialists of the department are making critical studies of the varieties adapted both to the East and to the Southwest, to determine which have both the orchard characters and the nut characters that make them satisfactory from the cracking standpoint.

In the Southeastern States the production of nuts in many of the large orchard plantings has been disappointing. This has been caused by many factors, including lack of proper soil fertility and proper management practices, and the prevalence of fungous diseases and insects. Specialists of the department are studying soil-management practices in pecan production, also the effects of such practices as pruning, tree spacing, and thorough control of insects and diseases, on the productivity of pecan orchards.

Persian Walnuts

The production of Persian (English) walnuts in California and Oregon has been increasing moderately during recent years as increased acreage has come into bearing. Practically all of the increased acreage is of improved budded varieties. The early-walnut industry in that area was largely based on seedling trees. The use of improved varieties is resulting in a higher general level of quality. Improved grading equipment in packing houses is also tending to eliminate poorly filled or otherwise inferior nuts so that only superior-quality nuts reach the consumer.

In the walnut the pistillate bloom from which the nut is produced and the staminate or pollen-producing bloom occur on the same trees but develop from different buds. In certain varieties the pistillate and the staminate blooms do not develop simultaneously, consequently the pollination of the pistillate bloom may be imperfect if single varieties are used for planting. In the Franquette walnut, for example, largely used in Oregon and planted extensively in California, the pollen is frequently almost entirely gone before the pistillate flowers have developed. Consequently, if planted alone, this and other varieties are likely to set poorly, because of lack of pollination. The research work of the department is being directed toward determining the most suitable planting combinations and varieties for most satisfactory produc-

tion. Artificial pollination methods are also being tried where there are plantings of single varieties, apparently with very satisfactory results.

Almonds

The number of varieties of almonds grown in California has been greatly reduced during recent years. The present trend is toward the production of paper-shelled and soft-shelled nuts of the better varieties, particularly the Nonpareil. Other important varieties are Ne Plus Ultra, Drake, Texas, and Peerless. The elimination of inferior varieties has largely resulted from critical studies of varietal characteristics made by the department a few years ago. Extensive breeding investigations, now under way, are expected to result in improved varieties of almonds, particularly for manufacturing purposes.

Filberts

Filbert production in Oregon and Washington is a relatively new industry that is developing rapidly. At present it is based chiefly on European varieties, the Barcelona being mainly grown in Oregon, and the Du Chilly in Washington. The Brixnut filbert is being planted to a limited extent. The department is assisting in the development of this industry by making critical studies of the adaptation of different soil types to filbert production and by studying the effects of various orchard-management practices, including irrigation, soil fertility, and handling methods, on the quality of the nuts.

J. R. MAGNESS *and associates, Bureau of Plant Industry.*

VEGETABLE Breeding and Disease Studies Win Important Results Investigations of vegetable crops by the Federal and State research agencies are designed for the development of (1) improved varieties, and (2) methods of production and disease control that will insure the highest yields per acre and the highest quality that can profitably be obtained. Low yields per acre usually cost more to grow, per unit of product than do high yields and the quality is usually low, thus reducing the producer's profit through high cost and low sale of product. When purchasing products of mediocre quality the consumer gets less for his money than when purchasing high-quality products that contain less waste, are more palatable, and are pleasing to the eye. New high-yielding varieties and disease-resistant varieties make lower production costs possible and help to obtain a product of higher market grade and greater value for the grower's effort and for the consumer's dollar. In the absence of disease-resistant varieties, special methods of disease control attain the same ends in many cases. Improved methods of propagation, culture, crop management, and handling of the product have also played their part in increasing values for both producer and consumer. In extreme cases almost whole industries that were threatened with destruction have been saved.

Some new or improved varieties and special methods for controlling diseases and other vegetable-plant troubles are briefly discussed here to illustrate the nature and emphasize the value of the research done in the last few years by the agencies mentioned.

Sweetpotato-Disease Control

It has been estimated that diseases of sweetpotatoes in the plant bed, field, storage, and market caused losses amounting to 40 per cent of the crop, worth $25,000,000 to $30,000,000 a year, between 1918 and 1924. Between 1925 and 1930 the losses were reduced to about $8,000,000 a year as a result of research on diseases. Much of the important knowledge of these problems was obtained by the Department of Agriculture.

The application of sanitary methods in the seed bed is necessary as the starting point in control of sweetpotato diseases. Repeated use of the same soil (or sand) in the seed bed is one of the surest ways of perpetuating sweetpotato diseases. The use in the seed bed of soil free from disease-producing organisms will help to reduce such soil-borne diseases as black rot, foot rot, scurf, Sclerotium rot, Rhizoctonia, and possibly others. It is important, therefore, that the soil, sand, or manure from the old beds should be replaced before the new crop is bedded. The rubbish and decayed sweetpotatoes should be removed from around the beds and destroyed. Before the new soil or sand is put into the bed, the framework should be disinfected by thorough spraying with a solution of formaldehyde (1 pint of commercial formalin to 30 gallons of water). If more convenient, a solution of copper sulphate (4 pounds to 50 gallons of water) may be used.

The soil or sand for the seed bed should never be taken from fields where sweetpotatoes have been grown. Sand is preferable to soil, but, whichever is used, it is advisable that it be obtained from the woods or from uncultivated fields. If other sources of heat are available, stable manure is not recommended for use in the seed bed because it may contain disease germs.

The sweetpotatoes selected in the fall for seed purposes should be stored in baskets or crates, apart from the general stock. In the spring, just before bedding, they should be carefully picked over, and any that show black rot, scurf, foot rot, or other disease, or wounds and bruises, should be discarded and only those free of any blemish should be used in the actual bedding.

The sweetpotatoes selected for seed should be disinfected by being immersed for 8 to 10 minutes in a solution made by dissolving 1 ounce of corrosive sublimate (mercuric chloride) in 8 gallons of water. Corrosive sublimate is a deadly poison and should be kept out of reach of animals and irresponsible persons. The sweetpotatoes should be bedded as soon as the treatment is completed, because rinsing in water is not necessary and probably inadvisable. The treatment will not destroy germs within the potatoes but will only kill organisms on the surface. Only wooden or glazed crockery containers should be used. After treating about 10 bushels in 24 gallons of the solution, one-half ounce of corrosive sublimate, dissolved in hot water, should be added and the solution made up to the original amount by the addition of water. Repeat the process after the treatment of each 10 bushels until 30 bushels are treated, then throw away the solution and proceed with a fresh one. Corrosive sublimate can be purchased at any drug store.

Although healthy plants may be grown by using care in seed selection, seed disinfection, and preparation of the hotbed, these efforts are largely wasted if the plants are set in disease-infested soil. Since some of the disease-producing germs will live in the soil almost indefinitely,

even in the absence of the sweetpotato plant, sweetpotatoes should not be planted on the same ground oftener than once in three or four years. No other cultivated crops are subject to the more common diseases of sweetpotatoes, so any crop commonly grown in the region may be used in the rotation.

Disease-Resistant Tomato Varieties

Several years ago the early-tomato-shipping industry of Florida was threatened with destruction by nailhead rust and Fusarium wilt. The development of new varieties that would resist these diseases was the only solution of the problem. The Marglobe tomato, now grown more or less extensively over much of the United States, is the result of breeding and selection for resistance to these two diseases, and was introduced about 1925. Although this variety was developed primarily for the growers of the Florida shipping crop, it has proved to be an excellent early midseason home-garden, market-garden, and canning variety. Probably no other variety is grown so extensively for such a wide diversity of uses.

An early variety, Break o' Day, introduced in 1931, is also resistant to nailhead rust and to wilt. This variety appears to be less widely adapted than the Marglobe, but in many market-garden and trucking areas is very highly regarded for early market. Break o' Day is the earliest of the disease-resistant varieties. It is not recommended for canning. The most recently introduced disease-resistant variety is Pritchard, named for the late F. J. Pritchard, who produced other wilt-resistant varieties of tomato as well as the three named. The Pritchard tomato is a second-early variety, a few days later than Earliana. It ripens its fruit within a rather short bearing period, yielding a few heavy pickings. It has attracted most favorable comment because of its excellent scarlet color. It can not be recommended as a major variety for canning, on account of its short heavy-bearing period that might be conducive to serious gluts and consequent losses. Many canners, however, consider it very desirable for a part of the acreage that is to be handled at each factory, since it gives a high yield of rather early, very well-colored fruit.

Break o' Day and Pritchard are still new and not nearly so extensively grown as Marglobe. It has been estimated, however, that the crops of varieties developed by the Department of Agriculture have attained a value of $10,000,000 annually. The greater part of this value has been produced in areas so threatened by disease that the culture of disease-susceptible sorts is hazardous and unprofitable. These varieties can now be obtained from vegetable-seed dealers in all parts of the country.

Blossom-End Rot of Tomato

Not all serious troubles of the tomato are caused by microorganisms. Among the apparently nonparasitic troubles is one commonly observed by commercial growers and most home gardeners, blossom-end rot.

Blossom-end rot, or point rot, is prevalent and destructive in all States where tomatoes are grown. It causes greatest losses in the Gulf and Atlantic Coast States and in California, and often large losses in the Great Lakes area.

As the name implies, blossom-end rot appears on the blossom end of the fruit. However, it is characterized by appearing first as discolored areas along the core, the lesions usually following the vascular systems to their extremities. With further development a brown blemish appears under the fruit wall on the blossom end of the fruit. Very often internal browning of the core may appear without the disease developing further, the characteristic end rot not being visible on the surface. More often however, the disease develops rapidly as a dry, leathery, tough rot. The affected areas may be small or more frequently spread to cover half the fruit. The disease will affect fruit of any age, but appears more frequently on young fruit near the blossom end.

Galloway in 1888 published the first account of blossom-end rot of the tomato in American literature. From 1888 to 1910 considerable difference of opinion as to the exact cause of the disease prevailed among American investigators. Many were convinced that either fungous or bacterial parasites caused the disease, while others were of the opinion that the disease was nonparasitic, and associated with environmental and soil-moisture conditions. In 1914, when Brooks presented a detailed study of the disease, the opinion that parasitic organisms were its cause was almost discarded, and it was generally believed to be due to soil-moisture and environmental conditions. A publication by Brown in 1926, again raised the question of the possible relation of parasitic organisms as a causal agent of blossom-end rot. It is because of this difference of opinion that a summary of two years' work with four crops of tomatoes grown in the greenhouse is presented here.

Data obtained in these greenhouse studies definitely associate the tomato blossom-end rot disease with soil nutrients and moisture, and with temperature and humidity conditions, as related to vigorous vegetative growth and the utilization of water by the plant. Plants fertilized heavily with nitrogen and potash but no superphosphate, and grown in soil with the moisture held at 82 per cent of its water-holding capacity, developed 71 per cent blossom-end rot. Plants grown in the same moisture but fertilized lightly with nitrogen and potash, and heavily with superphosphate, developed only 26 per cent blossom-end rot. It is significant that with the progressive increase of the soil moisture from 39 to 82 per cent of the water-holding capacity of the soil there was also a progressive increase in the percentage of blossom-end rot. Only 1 per cent of blossom-end rot developed on plants grown in soil with the moisture held constant at 39 per cent of the water-holding capacity, while 45 per cent of the fruits developed end rot when the moisture was held at 82 per cent of the water-holding capacity. With the addition of either nitrogen or potash fertilizers a progressive increase in the percentage of blossom-end rot appeared. The appearance of blossom-end rot under greenhouse culture can be largely prevented by growing the plants at a relatively low temperature of 65° F. during the day.

The summarized data indicate that blossom-end rot remains in the group of nonparasitic diseases, since its appearance seems to be associated primarily with the excessive application of nitrogenous and potash fertilizers and with a relatively high soil-moisture condition, both of which promote rapid, vigorous vegetative growth. Also, high temperatures that are favorable to an excessively high rate of water loss from the soil and from the plant are conducive to the development of the disease.

It is evident that the disease can be controlled to a large degree by avoiding the use of large amounts of nitrogenous and potash fertilizers, by liberal use of superphosphate, and by preventing either extremely wet or dry soil conditions so as to promote vegetative development and avoid rank, succulent growth. In greenhouse culture, lowering the greenhouse temperature to 65° F. should be of considerable help.

Black-Heart of Celery Can Be Controlled

Black-heart disease of celery is found in its most prevalent and destructive forms in Florida and California, two of the largest celery-growing States, in both of which irrigation is used extensively. The disease is often prevalent in other important celery-growing areas and has been reported to occur seasonally in areas as widely separated as Canada and Bermuda.

In Florida the seasonal loss to celery growers is approximately 5 per cent of a 4-million-dollar crop. Furthermore, the disease may cause an individual grower to lose his entire crop. In the lower Rio Grande Valley of Texas, growers were forced to discontinue their attempts to grow celery, since black-heart usually destroyed the crops. Often 60 per cent of individual plantings are lost in Utah, and similar losses have occurred in Wisconsin and New Jersey.

The disease affects principally the tender growing leaflets in the heart or crown of the plant, producing first a necrosis near the tips or margins. It advances rapidly, causing large brownish lesions which later become black, and these symptoms account for the origin of the common name "black-heart." The plant may develop and recover from the disease as many as five times, but as it approaches maturity the advance of the disease is usually so rapid as to destroy the entire crown part in a few days. The disease is usually characterized as a typical dry rot, but often the secondary invasion of organisms of the *Bacillus carotovorus* group will produce a slimy, soft rot, leaving symptoms similar to those of a parastic disease.

In 1897, Kinney, of Rhode Island, made the first report on the prevalence and destructive nature of celery black-heart in this country. Winters, of Florida, was of the opinion that heavy application of certain fertilizer materials contributed greatly to the prevalence of the disease. He also recognized its indirect relation to environmental factors and soil moisture, but had no data to support definite conclusions.

A 10-year study of the celery black-heart disease has been made by the Department of Agriculture, and the data collected during 5½ years in Sanford, Fla., 3 years in Wisconsin, and 2 years in a greenhouse at the Arlington Experiment Farm, Rosslyn, Va., are summarized here.

Usually the disease is caused either by drought or by excessive soil moisture due to heavy rains or excessive irrigation. Heavily fertilized, vigorous, succulent, rapidly growing plants are more severely affected than are slow-growing, lightly fertilized plants. Excessive irrigation apparently causes asphyxiation of the roots and ultimate death of the root hairs, creating a condition of drought. In Florida the disease is more prevalent on the light sandy soils than on the muck soils, indicating that it is easier to maintain a soil-moisture balance in the muck soils having high water-holding capacity. When fertilizer applications were increased from 1 ton to 6 tons per acre, no black-heart developed under the 1-ton application, whereas 80 per cent of the plants developed the disease under the 6-ton application. The disease was

held under control for four years, however, by careful regulation of irrigation water regardless of the amount of fertilizer applied. Any factor that promotes extremely rapid growth predisposes to the attacks of the disease. Since a relatively high temperature promotes rapid growth, the disease is more prevalent after periods of high temperature. High temperature may also be related to black-heart because it causes greater evaporation of moisture from the soil and more rapid transpiration or water loss from the plant, creating a condition of drought in both soil and plant. Experimental data indicate that the form of nitrogen used in the fertilizer does not determine the prevalence of black-heart, but that the amount applied greatly influences the disease. The heavier the nitrogen application the greater will be the amount of black-heart unless moisture is properly controlled. The fertilizer formula that promoted the best growth when applied in large amounts also produced the largest number of diseased plants, further demonstrating the relation of plant vigor and excessive fertilizer to the prevalence of the disease.

Considerable success has been experienced in controlling the disease under field conditions by using varieties more resistant to the disease, by avoiding the use of large amounts of nitrogen, and, most important of all, by the careful regulation of irrigation water. Excessive soil moisture just before or at the time of harvest will invariably produce a large amount of the disease. The rapidly growing varieties are usually more susceptible than the slow-growing types. The new French strain of tall Golden Self-Blanching was the most susceptible of all strains tried. Golden Self-Blanching was also found very susceptible. Many of the newly developed strains of celery, such as Meisch Special or Wonderful, and Golden Plume, are decidedly more resistant than are some of the older varieties. The disease attacks all known varieties of celery, but the attack is less severe on the dark-colored and slow-blanching strains than on the easy-blanching types.

Control of a Mosaic Disease of Celery in Florida

For some years before 1930 celery growers in Florida had suffered heavy losses from the attacks of a mosaic disease which caused a browning and shriveling of the leaf stalks and a general stunting of the plant. While the disease was more or less localized, certain growers sustained complete losses, and conservative estimates placed the total losses in one section at over $50,000 in some seasons. This disease is apparently gaining in seriousness.

The first symptom of the disease to appear on celery is a yellow mottling of the young leaves, similar to that caused by virus diseases of the mosaic group. These leaves gradually develop a bleached appearance and the petioles or leaf stalks curl downward. At the same time the petioles may show a brownish discoloration and shriveling which render the plant unfit for commercial uses. Affected plants usually occur in groups in the row and because of their stunted appearance lend a ragged appearance to the field.

Investigations have shown that the virus of this form of mosaic apparently does not persist in the soil or seed but that it does live over in a common weed (*Commelina nudiflora* L.), known both as the creeping dayflower and (in Florida) as wild wandering-jew. The leaves of the infected weeds have yellow blotches which often assume a circular form, while the leaves of healthy plants are uniformly green. An aphid

(*Aphis gossypii* Glover) which is very abundant on celery in Florida also feeds on Commelina and readily carries the virus from the mosaic-affected Commelina to healthy celery. This is especially true where the mosaic-diseased weeds grow in patches close to the edges of celery fields.

Two seasons' experiments have shown that celery mosaic may be successfully controlled by removing weeds from about celery fields. Commelina is not easily killed by hoeing or drying, so that it has been found advisable to remove the weeds by the roots and dispose of them by burying, burning, or feeding them to stock. This process is not difficult. In experiments carried out during the winters of 1930–31 and 1931–32 it was found that in fields which before this time had shown losses ranging from 60 to 80 per cent, the losses after careful weed eradication were reduced to 6 per cent. Under most Florida conditions this method appears to be perfectly practical for controlling celery mosaic.

New Disease-Resistant Potatoes

The cost of producing marketable potatoes is greatly increased by the losses due to the many diseases that attack the growing crop and the tubers in storage. Disease-control measures cost the growers millions of dollars annually, and, in spite of them, millions of bushels are lost each year.

Among the most destructive diseases that attack the potato are the virus diseases, or so-called "running-out" diseases, and late blight. The virus diseases add to the cost of production, in that many of the potato-growing regions can not produce their own seed but must obtain it from certain Northern States or from Provinces of Canada, where the conditions for the spread of these diseases are less favorable. The production of seed in these more-favored regions is increased in cost by the necessity of growing seed plots and of roguing continuously.

The severity of late blight fluctuates from year to year, but the control measures for this disease alone cost the growers from $20,000,000 to $25,000,000 annually. In spite of these measures the loss from late blight averaged approximately 25,000,000 bushels for the three years 1920, 1926, and 1928.

Soil-borne diseases such as common scab, Rhizoctonia, and Fusarium wilt also exact their toll. Control measures for these diseases are comparatively ineffective, especially if the crop is to be grown in soil that is infested with the organisms causing the disease.

The development of disease-resistant varieties is the ultimate solution for all these problems in potato growing. The results that have been obtained through potato-breeding efforts indicate that such a solution is possible. The Katahdin, a new variety that is being distributed to the growers by States cooperating with the Department of Agriculture, is highly resistant to a very common virus disease known as mild mosaic. This is important from the standpoint of the commercial grower but is far more important from the standpoint of the breeder, since in the production of this variety resistance to a virus disease was definitely shown to be transmitted from parent to offspring. Through the cooperative efforts of plant breeders and pathologists, varieties resistant to other diseases have also been obtained. At Presque Isle, Me., in 1932, several hundred seedlings were grown in an unsprayed plot to test them for resistance to late blight. A heavy epidemic of the disease occurred, and six of the seedlings manifested

marked resistance to it. Several varieties resistant to scab have also been found. No variety that combines resistance to these various diseases is yet available, but an excellent foundation has been laid, and it should be possible, by increased effort, to obtain a variety commercially desirable in shape, depth of eye, cooking quality, etc., and with the combined resistance to virus diseases, late blight, and common scab. This would greatly reduce the cost of producing the potato crop by saving the millions of dollars now spent in control measures and by eliminating the loss of 20,000,000 to 30,000,000 bushels of potatoes in blight-epidemic years.

Improvement of Size and Yield of Peanuts

In 1931 over 2,000,000 acres were devoted to peanuts in 12 Southern States. The crop had a farm value of almost $30,000,000. This figure is much lower than the average because of the abnormally low prices received by the growers in 1931. The value of the crop varies from year to year, but is ordinarily about $40,000,000 to the producers.

Two types of peanuts, the Virginia or large-seeded and the Spanish, make up most of the crop. The Virginia-type peanut is grown largely in southeastern Virginia and northeastern North Carolina, where climatic and soil conditions are especially suitable. Some Virginia-type peanuts are grown elsewhere, but most of the peanuts grown in the other regions are of the Spanish type.

The quantity of peanut seed required per acre depends upon the type of peanut and upon planting distances. On the basis of 25 pounds per acre, it requires about 50,000,000 pounds of seed peanuts to establish the crop each season. Many firms and individuals specialize in supplying peanut seed, but a comparatively small proportion of the seed requirements is purchased. Growers generally make a practice of using their own seed year after year, and carelessness in saving seed is undoubtedly responsible for the production of large quantities of small-sized, poor-quality peanuts.

Large-size peanuts suitable for special purposes, such as salting, usually bring a premium, often as much as one-half cent more per pound for farmers' stock. Although many growers produce peanuts that are inherently large, most of the commercial large-podded and large-seeded peanuts are screened out of farmers' stock. Ordinarily only a comparatively small proportion of the factory-run stock can be placed in the extra-large shelled class, of 30 to 32 peanuts to the ounce. During certain seasons the proportion of large-sized peanuts in the average commercial stock is not over 15 per cent. There is need for seed stocks of varieties that have inherent qualities for size, and it is to the growers' interest to use these seed stocks whenever available.

Improvement work with peanut seed stocks was undertaken at Florence, S. C., in 1915 by the Department of Agriculture in cooperation with the South Carolina Agricultural Experiment Station. Hill selections made in 1919 are the basis for a number of improved strains. In 1928, in compliance with requests from peanut growers and handlers, more extensive improvement work with large-seeded Virginia-type peanuts was undertaken at Holland, Va., in cooperation with the Virginia Agricultural Experiment Station. Seed of one strain of Jumbo, known as Jumbo, 5-24-3, the progeny of a single hill selected in 1919, and since grown at Florence, S. C., was included. A strain of Jumbo known as Virginia Station Jumbo, produced at the Holland station

from a single hill selection, and a number of lots of seed obtained from commercial sources, were included in the trials.

In 1929, 21 lots of large-seeded strains of peanuts were grown in replicated plantings, and the yield of hay and peanuts and the proportion of shelled peanuts to unshelled stock were determined. Hill selections were made from all of the more promising lots. Several of the large-seeded commercial lots proved to be mixtures of different varieties, and these were discarded. By 1931 only 8 of the 21 lots grown in 1929 were deemed worth additional trial. These were grown in replicated plantings and records were taken as in 1929. The average size of these eight strains and varieties, as shown by the field trials during these years, was well within the classification of extra large; that is, 30 to 32 to the ounce. These 8 lots were among the 10 highest yielders of all sorts that have been tested. Of these 8 lots 1 was the Jumbo produced from a hill selection made by the department at Florence, S. C., another was the Jumbo produced from a hill selection made by the Virginia experiment station, and the other 6 were from commercial sources. Seed of these strains and varieties is now being produced in quantity by commercial growers.

Improvement work with Spanish-type peanut seed stocks has been based on the development of two ideals, (1) medium-sized, and (2) large-sized peanuts, both of which will show improved yielding capacity and a high proportion of shelled to unshelled peanuts. A number of large-sized Spanish strains have been developed from single hills, but these do not especially appeal to the trade, because they are difficult to handle in the cleaning and shelling plants. One medium-sized strain known as Spanish 18–38 has proved extremely desirable. It is a heavy yielder, large-scale commercial tests with it in Georgia in 1930 having shown yields of over 1,300 pounds per acre, which is much above the average. Tests at the Pee Dee Experiment Station in South Carolina also have shown it to have high-yielding qualities, combined with a proportion of about 80 per cent shelled to unshelled stock. This strain has been widely distributed throughout the Gulf Coast States, where it is very highly regarded by growers and dealers.

The large-sized Virginia-type stocks and the Spanish 18–38 strain are suitable foundation stocks for a stable peanut-seed industry. Their use will greatly enhance the value of the crop to both growers and handlers.

Development of Disease-Resistant Lettuce

A very striking example of saving a large agricultural industry by developing disease-resistant varieties is that relating to lettuce growing in California. Nearly half the lettuce produced in the United States is grown in that State. A few years ago the industry in the Imperial Valley, one of the two largest lettuce-growing regions of the country, was threatened with complete destruction by a disease commonly known as brown blight. Plants affected with this disease become yellow and stunted and eventually die. The disease is soil-borne, and after one or two crops had been grown it was necessary to shift to new fields. The suitable disease-free land was rapidly being exhausted. The Department of Agriculture began work on the disease in 1922 and has developed brown-blight-resistant strains of lettuce that will produce normal crops on the most severely diseased soils. These strains were introduced under the names of Imperial 2, Imperial 3, and Imperial 6.

Later, parts of the California industry were again threatened, this time by a mildew. And again plant-breeding activities effected a remedy. A mildew-resistant sort of lettuce was produced and, finally, varieties that are resistant both to brown blight and to mildew. Two strains of the new double-resistant sorts are named Imperial C and Imperial F. Most of the lettuce now grown in California is of these disease-resistant kinds. Even at current low prices it is estimated that these new varieties are returning $4,000,000 to $5,000,000 a year to lettuce growers.

Mosaic-Resistant Spinach

One of the earlier accomplishments in developing a disease-resistant variety was the production of the mosaic-resistant spinach named Virginia Savoy. Fall growing of spinach about Norfolk, Va., then the most important spinach-producing section of the United States, was endangered by the serious losses from a form of mosaic known locally as blight. Many other areas were less seriously affected. Workers of the Department of Agriculture and of the Virginia Truck Experiment Station discovered that a certain variety of spinach originally collected in northern Manchuria was resistant to the disease. This wild Manchurian form was very different from the cultivated sorts and unfit for commercial purposes. However, it was crossed with desirable commercial varieties, and the resulting hybrid material, after several generations, furnished plants of excellent commercial type from which the new variety was developed. The Virginia Savoy is highly resistant to the disease and is now widely grown for fall planting. It is also very hardy to cold, hardier than any other commercial variety, but is not suitable for spring planting because it shoots to seed very early in warm weather.

VEGETABLE RESEARCH STAFF, *Bureau of Plant Industry.*

QUALITY Progress Marks Present Stage of Canning, Drying, and Preserving

The first 25 years of the current century was a period of very rapid development of the food-preservation industries and especially of the canning of fruits and vegetables. The extent of this development is indicated by comparing the values given for certain products in successive census years. The census of 1899 stated the value of the 11 most important canned fruits and vegetables as $39,143,000. In 1909 the value of the same 11 products was $59,636,000; in 1919, it was $260,429,000; and in 1929, it was $266,718,000. This is very nearly a sevenfold increase in the value of these products within 30 years. When there is added to the 1929 total the value of all the various canned fruits and vegetables and related products, such as jams, jellies, preserves, and vegetable soups, the grand total becomes $750,342,000. For the raw materials growers received $201,177,000.

This immensely rapid increase in value and volume of canned fruits and vegetables has been brought about in two ways, by constant additions of new products to the list, and by steady increase in volume of the older items. In 1899 the total pack of any of the four great staple canning crops—tomatoes, corn, peas, and beans—did not exceed 5,000,000 cases. In 1929 the packs ranged from 7,500,000 cases of snap beans and approximately 17,000,000 each of corn and peas, to

21,400,000 cases of tomatoes. For some years the annual production of snap beans, peas, and tomatoes has approximated 15,000,000 cases each, or three times that of 1899, and has had a value closely approaching or in some instances exceeding that of all the canned fruits and vegetables produced in 1899. Concurrently with this growth in production of the older staples has been an even more rapid increase in the volume and value of what were relatively small and unimportant products 30 years ago, and a constant addition of new products that have quickly gained general favor and reached large production. The increase in value of the annual production since 1899 is eightfold to tenfold for canned apples, apricots, peaches, pears, berries, and cherries. Such vegetables as asparagus; spinach; sauerkraut; beets; pumpkin; squash; tomato pulp, paste, and juice; and vegetable soups and such fruits as olives; prunes; grapefruit; and grapefruit juice have made their first appearance as canned products at various times within the last 25 years and have gained importance and popularity very rapidly.

There have been equally rapid advances in production of most lines of dried fruits. Evaporated apples are an exception; production has shown no sustained increase within the last 25 years, and the tendency during the last 10 years has been toward reduction of output. This tendency has been pronounced in the Eastern States, with the result that production now centers in the Pacific Northwest and California. Lessened foreign demand, together with domestic competition from canned apples and apple products, has been responsible for the decline. The same explanation applies to the practically total disappearance of evaporated blackberries and raspberries from the markets. The production of dried apricots and peaches has increased from about 5,000,000 pounds each in 1899 to approximately eight times this quantity in 1929. The increase in dried prunes in the same period was from 25,000,000 to 347,000,000 pounds, whereas production of raisins has advanced from 10,700,000 pounds in 1899 to 421,000,000 pounds in 1929, or a fortyfold increase in 30 years. In the same period the aggregate value of evaporated fruits has increased about sixteenfold, from $4,757,000 to $75,891,000.

Increase in Production Checked

The progressive increase in production which characterized the canning and drying industries throughout the period under discussion has now slowed down or entirely ceased. While the production of any given product fluctuates considerably from year to year because of uncontrollable causes, there is no longer any tendency toward progressive increase in production of any of the more important preserved fruit and vegetable products. In practically all, production has remained for some years at a fairly constant level or has shown a tendency to drop below the high levels established in earlier years.

Fruit and vegetable growers are greatly concerned over the serious reduction in returns which this condition brings about, and there is rather generally expressed feeling on the part of persons who know the amounts of fresh fruits and vegetables that are annually lost, that this loss should be stopped by such an expansion of canning, drying, and preserving as would convert the material into nonperishable forms. The idea is frequently expressed that in the absence of any movement to this end on the part of the industries themselves, the Federal Gov-

ernment should encourage and support or establish activities designed to preserve these potentially valuable food materials. Such proposals overlook the fact that conversion of perishable foodstuffs into less perishable forms does not necessarily insure that the material can be disposed of at a profit or even at cost of production. The fact that those most deeply interested in the industry can not see any such degree of insurance upon this point as would justify further expansion of their business is responsible for the halt in growth of the preserving industries. Many people fail to appreciate the fact that for many of the canning crops the cost of empty tin cans at the factory exceeds the value of the products that would be conserved. For this reason, preserving surplus crops by canning them when there are no assured markets for the canned product, is economically indefensible and would be financially ruinous to those who engaged in it.

The volume of preserved fruits and vegetables has increased much more rapidly than population and consequent consuming capacity in existing areas of distribution. The number of products has also increased, with the result that the various canned or preserved fruits and vegetables are in active competition with one another. Introduction of a new product, or any increase in the consumption of an older one brought about by effective publicity or otherwise, can only result in displacement and reduced consumption of some other product or products.

Competition With Fresh and Frozen-Pack Products

Another factor that is contributing in constantly increasing degree to this situation is competition in the markets with the same material in fresh form. The period during which any particular fruit or vegetable is available in urban districts is being steadily lengthened through greater knowledge of transportation and storage conditions that best preserve the appearance and table quality of the material and make it possible to supply any particular market with a perishable fruit or vegetable throughout the whole of its growing season. One comparatively recent development in this field that directly affects the demand for the canners' leading staples is the very rapid increase in the volume of fresh tomatoes, sweet corn, and green beans and peas from the lower South and from Mexico that reach northern markets in the late winter and early spring.

Still another factor that, in increasing degree, narrows the markets for canned and dried fruits, is the increase in volume of frozen-pack fruits and vegetables. Preservation of berries and cherries by freezing them in barrels was begun about 20 years ago as an alternative to canning, and has grown in importance until it now supplies not only preservers but also a considerable portion of the soda-fountain, bakery, and hotel trade. In its later developments freezing preservation is being applied to a considerable number of fruits and also to vegetables packed in small consumer packages. Enthusiasts' statements that freezing will ultimately supplant other methods of preservation and that a loss of perishable foods amounting to many millions of dollars annually might be prevented by its general adoption must not be taken too seriously, but the fact that approximately 1,600,000 pounds of berries are now being frozen annually in the Pacific Northwest indicates that as the problems involved are solved, frozen packing may become increasingly important in food preservation.

Standardization and Improvement of Quality

Increasing recognition by the preserving industries, of the situation just outlined has resulted in a general shifting of effort from increase in production toward standardization and higher quality in products. This movement, now well under way, is taking a variety of forms and is being actively assisted by Federal agencies and by various State experiment stations. In the drying industry, which to a very large degree has remained a farm activity carried on by the growers themselves, there has been a very definite improvement in quality of products, brought about through greater attention to the grading of the raw material for proper maturity and freedom from blemishes, to adoption of improved methods of drying, to general adoption of more rigid standards for appearance and moisture content of the product, and to the rather general abandonment of the bulk package in favor of smaller consumer packages combining more attractive appearance with better protection against moisture and insects. In California there has been for some years a definite movement toward replacing sun-drying processes by large-capacity, artificially heated dehydrators. The low cost of fuel oil in most of this area makes it possible to operate such equipment at a cost little if any higher than that of sun drying, and the greater speed and uniformity of drying, the slightly higher yield of dry product, the greater freedom from dirt and insect infestation, and the sense of security against possible loss from unfavorable weather, have promoted construction of evaporators in sun-drying centers. In areas where sun drying was never possible, as in the prune-growing and apple-growing districts of Oregon and Washington, there has been a progressive improvement in construction and efficiency of evaporating equipment in the degree of care exercised in grading and preparing the fruit, and in the control of the temperatures employed in drying.

In the canning industry there is a very definite and rather widespread movement toward the reduction in volume of the pack of the lower grades and especially of substandard grades. This movement arises out of a somewhat general recognition on the part of canners that the packing of poorly graded, overmature, or undermature material to be delivered to distributors without the packer's label has decidedly injurious effects on the market for the higher grades. This effect comes partly because the confidence of consumers in canned foods is destroyed and partly because the practice gives opportunity for misrepresentation by distributors. More than one canner has been shocked to find that the anonymous, substandard products that he packed and sold practically at cost of production, were being sold under fancy labels in direct competition with his high-grade products and at very slightly lower retail prices.

Parallel to the movement just indicated is marked progress toward adopting such definite Government standards for the various grades of canned products as will indicate their quality and desirability to purchasers in the same way that the standard grades for fresh fruits and vegetables now do. Both these movements are vigorously supported and fostered by both Federal and State agencies. An official grading service has recently been made available by the Bureau of Agricultural Economics for the benefit of the canners. Through it they may obtain official certificates of grade on samples of merchandise that they submit to the bureau for certification. The promulgation of grades under this activity and the inspection service are also helpful to bank-

ers who finance stored stocks of canners' merchandise. In addition to its obvious benefits to the public, the establishment of definite standards is directly beneficial to the producer of raw material, since the canner in turn establishes grades for the fruits and vegetables he uses and pays a premium for high quality.

Substantial progress is also being made toward securing higher quality in canned and preserved products through intensive study of the raw materials. The factors constituting quality in tomato products are receiving intensive study at the Indiana Agricultural Experiment Station, and comparative studies of the canning quality of leading tomato varieties have been carried on at the Maryland station. In the Bureau of Plant Industry of the United States Department of Agriculture, studies of the comparative adaptability of varieties of the more important fruits and vegetables to canners' use have for years been an important line of investigation. Such comparative studies of sweetpotatoes, sweet corn, and peaches have been completed, while others dealing with pumpkins, peas, tomatoes, apples, and beets are well under way. These studies involve the determination of the factors constituting or contributing to quality in the canned product, of the comparative ranking of varieties with respect to the degree in which they possess these qualities, and of the effect upon the material of various factors such as stage of maturity, cultural treatments, and climatic and environmental conditions. All of these studies, together with much of the breeding work in progress in the bureau, have as their objective to make possible the production of finished products of a higher degree of uniformity and possessing greater palatability and food value.

Consequently, the outlook for the fruit and vegetable preserving industry possesses distinct promise. There is no immediate prospect of any material expansion, and it is clear that any movement in the direction of increased production at present would be highly unfortunate. There is general realization of this fact throughout the industry. As a result, the period of standstill in total production is in reality a period of very intense activity directed toward the production of standardized products of the highest possible quality. In consequence the industry is building the soundest and safest possible foundation for future growth when improvement of economic conditions throughout the world makes such growth possible.

J. S. CALDWELL, *Bureau of Plant Industry.*

METHODS of Handling, Transporting, and Storing Perishables Improved

Success for a farmer is not measured entirely by the quantity of the produce that he raises, nor even by its quality. It is often said that he is producing too much, and at present he can not find a profitable market for his output. Unless he can get his fruit and vegetables to market in good condition, his returns usually are disappointing. Frequently only the best offerings bring a profitable return. It does not pay to ship poorly packed and unattractively conditioned lots to distant markets.

Several of the principal fruit-producing sections of the United States are on the Pacific coast, in the Southern States, or in other regions from which it requires several days to ship produce to the principal markets. Therefore, in such sections "shipping varieties,"

varieties with good shipping qualities, are principally grown. However, it frequently is necessary to harvest even these varieties before the fruit has reached the stage at which it will ripen with the best quality for eating. The United States Department of Agriculture has given considerable effort to developing maturity standards in order that fruit of better quality may reach the consumer. Information obtained in the course of this work has been widely used by the shipping trade and in establishing official grades and standards for regulatory purposes.

Frozen-Pack Fruits and Vegetables

While the necessity of shipping a thousand miles or more may require that some kinds of fruit be picked before they have attained best quality, fully mature and properly ripened fruits can be marketed from even the most distant producing regions by the frozen-pack method, by which the fruit can be packed either in barrels or in smaller air-tight containers, with or without sugar or sirup, and held under refrigeration until needed for use. By this method high-quality fruit can be kept in quantity for extended periods to supply jam makers, bakers, confectioners, and ice-cream manufacturers as well as for dessert purposes in the home.

The method also offers possibilities in handling certain vegetable crops, particularly peas and lima beans. The particularly pleasing flavor of the products when fresh from the garden is largely lost in canning but may be very satisfactorily preserved in frozen pack. This method is already being utilized to some extent by the hotel and restaurant trade as well as in the dining service of steamship lines, where quality is stressed and good refrigeration facilities are available. However, certain problems peculiar to vegetables must be solved before more than limited application of this method can be attempted. The department therefore is not ready to recommend its general commercial use with vegetables.

A frozen-pack market is now open to fruit growers in many producing regions, particularly the Pacific Northwest, the Great Lakes region, and some parts of the South. Michigan sour cherries have been frozen for pie-making purposes for many years. Likewise, strawberries, raspberries, and other fruits have been frozen in barrels in the Pacific Northwest and in some parts of the South and shipped to jam makers throughout the country. Recently there has been a growing interest in packing high-quality fruit in small-sized consumer packages. The department's recent work in this field has demonstrated that the very rapid freezing of such products that has generally been practiced, is not essential; that the temperatures and facilities available at most cold-storage plants are entirely adequate for producing first-class quality frozen pack; and that expensive special equipment for very rapid freezing is not required. This work has likewise shown that certain varieties of fruits are better adapted than others to preservation by freezing. It is believed, therefore, that if the frozen-pack fruit business develops into a major industry it will require the use of special varieties rather than serving merely as a "safety valve" for present production of shipping varieties, just as the peach-canning industry in California has called for the use of varieties grown almost exclusively for canning.

163050°—33——23

Spray Residues and Their Removal

In conditioning fruits and vegetables for market a number of different problems are encountered. For example, the necessity of spraying to control insects and fungous diseases often results in the retention of objectionable spray residues which must be removed before the products can be marketed. These spray residues detract from the appearance of the fruit, and some, particularly lead arsenate commonly used on apples and pears, are dangerous to health when the residues are present in excessive quantities and the fruits are eaten without paring. While the effects of eating lead and arsenic in the amounts sometimes found on unwashed fruit may produce immediately serious effects in especially susceptible people, the most serious objections to these spray residues ordinarily arise from their cumulative effect on the human system.

In many sections insect control does not require heavy spraying, and in other sections spray residues are usually reduced to an unobjectionable amount by rains and other natural weathering processes. How-

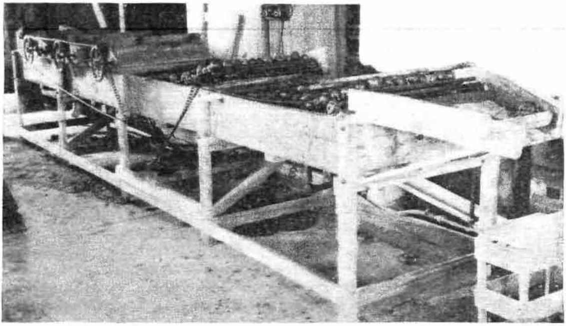


FIGURE 53.—Paddle washer for removing spray residue from apples. (Directions for making the washer are given in Farmers' Bulletin 1687)

ever, in producing sections where heavy spraying is necessary for insect control, and especially where the spray residue does not weather off, the residue must be removed artificially, usually by washing the fruit in chemical solvents. This problem has been given increasing attention since about 1926, when, under the food and drug act, the department proceeded to regulate the interstate movement of fruit bearing excessive quantities of spray residue. While this regulation necessitated the installation of costly cleaning machinery by many producers, it insured the unrestricted movement of properly cleaned apples and pears to foreign and domestic markets.

While recognizing its obligation to consumers in enforcing the spray-residue regulations, the department did not neglect its duty to the producers, and from the outset has made studies of cleansing methods that could be employed to remove spray residues most efficiently and economically and without impairing the keeping quality of the fruit.

(Fig. 53.) The results of this work are now generally applied by the apple and pear industries in producing sections where the most trouble has been encountered. Considerable work has also been done in developing satisfactory methods for removing spray residues from grapes, cherries, peaches, and certain vegetables.

Spray residue is not a particularly important problem on citrus fruits, but the fruits require washing to remove dirt, soot from orchard heaters, scale, insects, etc. The washing process also provides an opportunity to give the fruit a disinfectant bath to reduce or control certain fungous diseases that otherwise might take a heavy toll during shipment or storage. Improved methods of washing and handling citrus fruit have been worked out by the department and are now in general use throughout the producing regions in California, Florida, and Texas.

Coloring Citrus Fruits

At certain seasons of the year fully mature citrus fruit requires artificial treatment to attain the attractive color demanded by the market. In the early part of the harvest season before cooler weather comes to stimulate color development of fruit in the center of heavily foliaged trees, as well as very late in the season when the fruit tends to turn green again after being fully colored on the trees, stimulation of coloring is required. This conditioning is done in special coloring rooms where the fruit can be subjected to controlled atmospheric conditions. Proper regulation of temperature, humidity, and ventilation must be maintained, together with the right concentration of coloring gases, of which ethylene is the principal one. This coloring process does not affect the food value of the fruit but merely insures that its appearance shall match its eating quality. Improved methods of coloring have been developed as a result of the department's investigations during the last three years. These have resulted in a better control of decay, a shortening of the coloring period, prevention of shrinkage in the fruit, and a more satisfactory coloring, with a price premium often averaging as much as 50 cents a box.

Culinary and Other Qualities of Stored Potatoes

The department's investigations on the storage of potatoes have revealed important information on the maintenance of good culinary quality, which, as it becomes known, is being reflected in market preference and demand. Nearly everybody knows that stored potatoes often are soggy and sweetish when cooked, and frequently are unsatisfactory for making potato chips or French fried potatoes after winter storage. The reasons were found to be that starch is converted into sugar in potatoes held in storage at temperatures below 40° F. In potatoes held at 50° or above, however, the starch is not converted, and when cooked or baked such potatoes are "mealy" and make good French fried potatoes and potato chips. If it is necessary to use the lower storage temperatures, however, to prevent sprouting and for long keeping, a considerable improvement in cooking quality can be effected by removing them from such low temperatures and holding them at a temperature of 55° to 65° F. for two or three weeks before use.

Economies in Improved Refrigeration of Fruits in Transit

Present economic conditions have focused the attention and efforts of farmers and others concerned in handling and marketing farm crops on the most economical methods that can be employed in the marketing process. Methods which theoretically or actually may be most efficient or effective often must give place to others less costly which alone can be used. In other words, the law of diminishing returns is being demonstrated in this field as in many others.

The transportation of oranges from California to eastern markets offers an example. For years the perishable nature of oranges has been stressed. Emphasis has been placed upon the necessity for the most careful handling to prevent mechanical injuries which open the way for decay, and on the use of full refrigeration in transit to maintain the fruit in good condition and to retard the development of any decay that may have started. This has involved reicing refrigerator cars from 10 to 12 times between California and New York City, where much of the fruit is sold. At each reicing station the train must be halted and cars switched to and from the icing platforms, all of which involves delays and costs beyond that of the ice used.

Improvements in railroad service have materially cut down the running time, so that it is now possible to deliver cars of oranges on the New York market 9 days after they leave California instead of 12 to 14 days or more, as was the case when "standard-refrigeration" service was inaugurated. It seems entirely possible to reduce the transit period still further by the more general adoption of modified refrigeration service which has been proved entirely practicable by investigations conducted by the Department of Agriculture since 1928. In this work the department has found that it is still necessary to stress careful handling of the fruit to avoid loss from decay, but that oranges can be transported under modified and less costly refrigeration methods and arrive on the New York market in a condition as satisfactory as when standard refrigeration is used.

Under the modified-refrigeration method, nonprecooled fruit is loaded into preiced cars and held for a day or two at the shipping point to cool in the cars. The bunkers are refilled by the shippers before the cars leave the shipping point and are reiced but once in transit. This method saves the cost of precooling equipment and also reduces the cost of refrigeration in transit below that incurred under the standard-refrigeration method, under which the fruit is loaded into warm cars that are not iced until the train is made up and ready to leave for market, after which the ice bunkers are refilled at least once a day during transit. The cars are delivered at New York City with bunkers full of ice, even if the fruit is unloaded immediately, and the remaining ice is wasted.

While, theoretically, standard-refrigeration service affords better protection to the fruit at the end of the journey and may actually be needed for shipments moving during extremely hot weather, or with "weak" fruit near the close of the shipping season, the use of the modified-refrigeration service is growing rapidly. The latter has the advantage of cooling the fruit more rapidly at the beginning of the trip, and, in reducing loss from decay and in maintaining the fruit in good condition, this initial cooling is more important than lower temperatures at the end of the transit period. The difference in rates for the two classes of refrigeration service amounts to $30 to $35 or more per car, which under present conditions represents a very substantial item in the profit and loss account of the shipper.

Transportation of Strawberries and Pears

Recent investigations by the department have demonstrated that similar economies are practicable in the transportation of strawberries from Florida to northern markets, at least in the cooler part of the year, and in the transportation of pears from the Pacific Northwest to New York and other eastern markets.

Strawberries are among the most perishable fruits, yet by using precooling methods developed by the department, that can be carried out in the car after it is loaded, the berries can be forwarded by express in car lots, precooled and not re-iced in transit, just as satisfactorily as under the former method of re-icing several times en route. The modified-refrigeration method saves $20 to $25 a carload.

In shipping pears from the Pacific Northwest, especially Bosc and other fall and winter varieties, the department's investigations have demonstrated that precooled fruit can be shipped with only one re-icing in transit, yet reach the eastern markets in satisfactory condition. Bosc pears, which can not be ripened satisfactorily in cold storage, can be shipped in this way and by the heat of their respiration during transit, ripened to the condition required for marketing. This avoids the expense of extra handling and conditioning after arrival. Omitting refrigeration in transit reduces the cost of transportation about $90 a car. This reduction, with the further saving on conditioning costs under present conditions, may mean the difference between profit and loss to both shipper and buyer.

Further economies have likewise been demonstrated in the possibility of heavier loading of precooled pears. The standard load has been 520 boxes, which is the maximum found advisable with warm pears. But the department found that the load of precooled pears could be increased to 720 boxes without endangering the carrying quality of the fruit and with a corresponding reduction in the cost per box of refrigeration when transit refrigeration is used.

Other Improved Shipping Practices

Other investigations by the department in the field of transportation of fruits and vegetables have special importance in reducing costs and eliminating losses. Among these, two are of special interest.

Improved methods of preventing damage to fresh fruits shipped during freezing weather have been worked out with shipments of apples and pears from the Pacific Northwest. Two types of injury occur more or less commonly in these winter shipments. One is freezing, occurring most frequently in the bottom layers in the cars. It has been very generally confused with a type of bruising that occurs only while the fruit is in transit and is due to the pounding or vibration of the car floor against the bottom of the boxes containing the fruit. These vibrations are absorbed by the outside layer of fruit and produce flattened bruised areas often indistinguishable from freezing injury, which is likewise largely confined to the same locations in the car because the region of the floor is the coldest place. The department's studies proved that the transit bruising could be eliminated by using a corrugated-paper liner in the boxes. This liner acts as a resilient cushion and absorbs the vibrations, thus protecting the fruit from damage that heretofore has totaled many thousands of dollars annually.

The other type of damage encountered in winter shipments of apples and pears is the acceleration of the ripening rate caused by the use of heaters to protect shipments from freezing. Charcoal heaters placed in the ice bunkers of the cars are commonly used to protect winter shipments during transit. Under standard heater service provided by the railroads one heater is lighted when the outside temperature drops to a specified minimum and a second when the temperature drops to a lower specified temperature, varying for different products; the heaters are extinguished when outside temperatures rise again to the points specified. This practice takes no cognizance whatever of the temperatures inside the cars. Heaters are attended only at certain designated stations, usually division points, which means that for periods of several hours at a time the fruit in a car may be subjected to unregulated temperature extremes. The department found in its investigations that under this practice temperatures as high as 60° to 70° F. or more, often prevailed in the upper part of the car while freezing temperatures persisted at the floor. A fully effective means of equalizing these temperatures has not yet been developed, but certain improvements in operating methods have been suggested. The work of the last two winters has demonstrated that it is entirely practical to govern heater service according to temperatnres prevailing inside the cars instead of according to outside weather conditions. Resistance thermometers or other indicating types can be installed inside the car at the bottom doorway and read from the outside without opening the car door. Refrigerator cars are insulated so that temperature changes inside them are influenced only slowly by outside conditions. Under the new method investigated by the department and known as "inside control," the heaters need not be lighted until the temperature inside the car at the floor, at the coldest place, drops to the danger point. When the temperature in this critical location rises sufficiently the heaters can be extinguished. It makes possible a more intelligent protection of the shipment, decreases the cost of fuel by reducing the time during which heaters are operated, and prevents long-continued overheating of the top of the load with consequent impairment of its subsequent keeping quality.

The service that the department has been able to render by investigating problems of handling, transportation, and storage has been a vital factor in building up and maintaining the fruit and vegetable industry of the country, particularly in producing centers far distant from the great consuming markets. It has contributed very materially to the development of highly specialized agricultural industries in regions where products can be grown to perfection but where, unless proper methods of handling, transportation, and storage are used these products can not be made profitable.

D. F. Fisher, *Bureau of Plant Industry.*

CONTROL of Fruit and Nut Diseases by New Method Making Headway

Methods of controlling pear blight were developed by the United States Department of Agriculture many years ago, and good results were obtained by cutting out and disinfecting portions of the trees that harbor the blight (especially by cutting out the "hold-over" cases during the dormant season and thus eliminating the germs that

live over the winter), by modifying cultural methods, by pruning trees into better shape to permit fighting the disease, and by other methods, yet growers have a hard fight against this disease in producing Bartlett, Anjou, Bosc, and other susceptible varieties that are commonly grown because of the high quality of the fruit. The fight is easier if more resistant varieties such as Kieffer, of low quality, and Seckel, of high quality, are grown.

Several years ago hand-pollination crosses of the more resistant varieties were made in the hope of selecting, from the resulting seedlings, varieties that would combine blight resistance with good quality. Of the 3,500 seedlings first produced, 2 appear to meet this condition; 2 more are blight resistant, but not quite so good in quality, though productive and promising; and several others are blight resistant, but not quite good enough in quality to compete. During

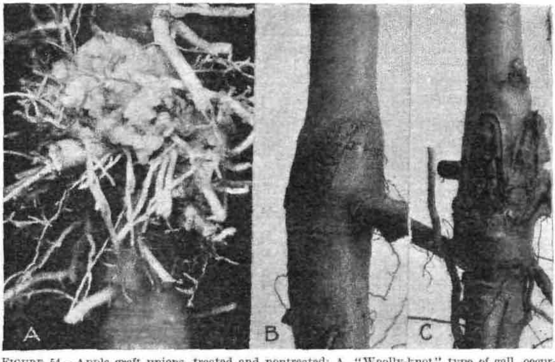


FIGURE 54.—Apple graft unions, treated and nontreated: A, "Woolly-knot" type of gall, occurring on approximately 30 per cent of trees growing from nontreated grafts. B, Smooth union obtained by disinfecting seedlings, and using the new rubber wraps. Number of galls reduced to approximately 10 per cent. C, Seedlings disinfected and grafts wrapped with raffia do not show unions as well knit as those on which the rubber wraps are used

the last seven years about 10,000 new seedlings have been produced for this study and are now under observation at the Arlington Experiment Farm, Rosslyn, Va. They are inoculated annually with pear blight to hasten the demonstration of their susceptibility. The very susceptible ones are being rogued out. Their productiveness and fruit quality will not be known until they come into bearing. It has proved much easier to obtain a fair degree of blight resistance from a large number of seedlings than to obtain the desired high quality of fruit.

Crown Gall

Crown gall, which is common and destructive on practically all kinds of fruit trees in the nursery and orchard districts of the United States, has been particularly severe and uncontrollable in one of its forms known as "woolly knot" in the eastern portions of the United States. (Fig. 54.) Losses from this trouble in the root-grafted apple nursery have frequently been 25 to 50 per cent of the trees.

The bacterial organism formerly known as the apple hairy-root strain of the crown-gall organism has been definitely established as causing the woolly-knot or hairy-root type of crown gall on grafted apple trees and has been named *Phytomonas rhizogenes*. Life-history and other laboratory studies on this organism have proved that seedling understocks are frequently sources of infection. A surface disinfection of the seedling understock has resulted in a considerable degree of control. New types of wrapping material for the graft union have been developed. A new wrap of adhesive tape is now being used extensively in commercial nurseries. An inexpensive and

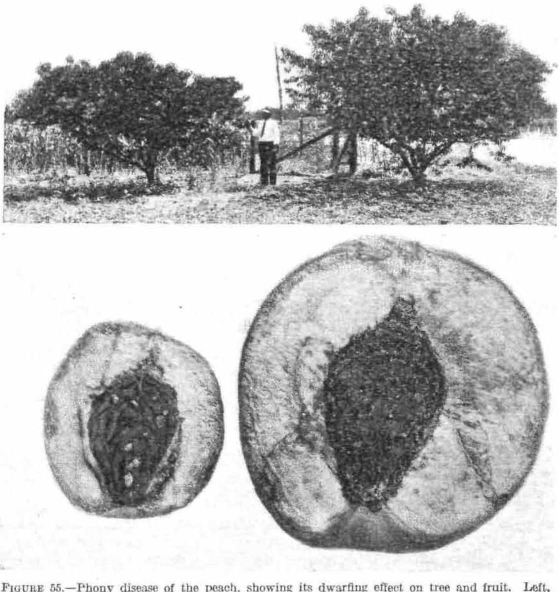


FIGURE 55.—Phony disease of the peach, showing its dwarfing effect on tree and fruit. Left, phony tree and fruit; right, normal tree and fruit

practical new rubber wrapping material has been devised and is being tested in cooperation with several nurseries.

Phony Peach Disease

The phony disease of the peach has occasioned the loss of more than 1,000,000 bearing peach trees in Georgia, and during the last decade has spread over scattered districts of moderate-to-light infection in a contiguous area comprising 12 additional States. (Fig. 55.) Research has shown that the phony disease is a new member of the peach-yellows group of virus diseases, although of totally different growth

characters, and that instead of being systemic, the virus is in this case confined to the root. The disease has been transmitted artificially only by grafting a phony root to the root system of a normal tree, and the incubation period is about 18 months. Since the virus does not become established in the fruit (including the seed), the buds, or the scions, these parts may be shipped and used freely without danger of disseminating the disease. Plum, apricot, almond, and other close relatives of the peach readily take the disease by artificial inoculation and must be considered potential carriers of the infective virus. Confirmatory identification of the disease in its early stages and under other doubtful or difficult conditions in the field has been made possible through the discovery of a simple and rapid laboratory test that is applied to the roots.

Such information resulted in the organization of the phony peach eradication campaign and of quarantine measures for practical control of the disease. Researches aimed at aiding these activities are now in progress and include studies on the natural means of dissemination, the time of natural infection, protective devices, developing rootstocks resistant to the disease, and the disinfection of nursery trees.

Peach Bacterial Spot

As a result of work on the development of new fungicides for use as orchard sprays, a new spray for the control of peach bacterial spot (*Bacterium pruni*) has been introduced. Bacterial spot has been recognized as a disease of the peach since 1907, but only in the last decade has it become so destructive to fruit and foliage as to cause serious losses. It is in some seasons a major disease in orchards of the South and Middle West, especially those planted in light, sandy soils. This new spray or fungicide, known as zinc-lime, is composed of 4 pounds of zinc sulphate and 4 pounds of hydrated lime mixed with 50 gallons of water. It has controlled mild cases of peach brown rot (*Sclerotinia fructicola*) and peach scab (*Cladosporium carpophilum*) and can be used in combination with arsenate of lead and with the sulphur sprays commonly applied to the peach during the growing season. It is cheap, easily made, and noninjurious to peach fruit and foliage. Leaves of peach trees sprayed with zinc-lime are usually larger and a deeper green than those sprayed with sulphur or left unsprayed. When combined with zinc-lime, arsenate of lead is less liable to cause burning of peach foliage, fruit, and twigs than when used alone or with other fungicides. Before the introduction of zinc-lime there had been no fungicide that could be applied to peach trees at frequent intervals, as is necessary in the control of bacterial spot, without causing serious injury.

Cluster Rot of Pears

Prior to 1930 cluster rot, spreading from centers in boxed winter pears from certain sections of the Northwest, was so serious that the growers estimated that they lost about $1 a box in refunds because of excessive rot and in a resulting demoralized condition of the market, because dealers were afraid to bid on the pears likely to be affected with this rot. Some consignments were so badly rotted that the public health authorities of New York ordered them dumped. It was not uncommon for 10 to 15 fruits to be affected by the spread of one initial rot. When it was discovered that the rot was spreading through the

wrapper from diseased to sound fruit, it seemed possible to prevent its spread by the use of a chemically treated wrapper. After experimental trials this was accomplished, and in 1930 there was devised and ready for use on a commercial scale a pear wrapper impregnated with sufficient copper sulphate to prevent the spread of the cluster rot on pears wrapped in it and yet not carrying enough of the chemical to be injurious to the fruit. The Apple Growers Association of Hood River, Oreg., alone estimated a loss of $15,000 because of cluster rot in the 1929 crop of pears, while on the 1930 crop, on which the growers used the copperized paper, there was practically no commercial loss. The rot on experimental holdings was reduced from 80 per cent to 2 per cent by the use of treated wrappers. The use of a chemically treated wrapper to prevent the spread of a fungous disease is an innovation in plant pathology.

Avocado Diseases

Avocado fruits in Florida are subject to three widely distributed fungous diseases that cause considerable losses. Two of these, scab and Cercospora fruit spot, attack fruits and leaves in early stages of their development. The third disease, known as black spot or anthracnose, does not attack fruits until they approach maturity. The Cercospora fruit spot is by far the most serious trouble of the three. Avocado varieties differ greatly in susceptibility to these diseases, and several of the leading commercial varieties are severely attacked. Spraying experiments conducted by the Department of Agriculture during the last two seasons have proved that when proper attention is given to the disease susceptibility of a particular variety of avocado and to the proper timing of the spray for the particular disease or diseases to which the variety is subject, satisfactory commercial control can be secured with two or at most three applications of 4–4–50 Bordeaux mixture. This reduction in the number of sprayings results in a considerable saving to the growers, and in greater effectiveness in control.

Cranberry False Blossom

Cranberry false blossom, which has been under intensive investigation in the cranberry districts of Wisconsin, Massachusetts, and New Jersey, has been found to be a virus disease and the vector, a leaf hopper, has been discovered. The disease has been traced back to its native origin in the wild bogs of Wisconsin and found to have been transmitted by means of nursery plants, to the bogs of New Jersey and Massachusetts where it has spread rapidly, seriously devastating many of the bogs and threatening the industry. Like the peach yellows it apparently can destroy the industry of large districts unless controlled. On account of the tangled mat of vines, originally composed of many individual plants, it can not be eradicated or rogued out, as is done with orchard trees. Definite progress has been made in its control by several different methods—eradicating the vector by flooding the bogs at suitable times; killing the vector by spraying or dusting with nicotine compounds; and renewing the bogs, replanting with disease-free nursery stock. The latter method is necessarily very expensive, since bogs once established ordinarily remain in fruiting for many years. This expensive procedure, however, is necessary with bogs that have been ruined below the point of profit.

Walnut Bacteriosis

Walnut bacteriosis, often called walnut blight, is one of the serious problems of Persian (English) walnut culture on the Pacific coast. It has caused serious loss for many years in California, and while its bacterial nature was discovered as the result of investigations by the Department of Agriculture many years ago, satisfactory control methods have only recently been developed. Recent work in Oregon has brought out the fact that carefully timed spray treatments with ordinary Bordeaux mixture, applied just ahead of the expected outbreaks of the disease in the spring and early summer, give effective results. These results are experimental and need confirmation, but are already being put into practice by progressive growers.

M. B. Waite, *Bureau of Plant Industry.*

UTILIZATION of Fruits and Vegetables Aided by Chemical Discoveries

Because the present varied American diet demands that fruits and vegetables be available the year round, there have been developed, as a result of scientific studies, several new methods for preserving such products, as well as marked improvements in older processes. During recent years the activity in these fields has been greatly increased with the result that it is now possible to provide for the consuming public a type and quality of food product not heretofore available.

Even in times of normal production and consumption the utilization of surplus cull and waste fruits and vegetables constitutes an important economic problem. The cost of producing such materials has already been paid by the grower, and unless this outlay can be absorbed in the price realized on the marketable goods the culls and waste will represent a definite loss to him. In times of overproduction and underconsumption the problems of utilization are greatly increased. It is but natural, therefore, that for a number of years increasing attention has been paid to methods of utilizing these materials.

Preservation by Freezing

The freezing of foods in packages is a comparatively recent development in food preservation. Approximately 100,000,000 pounds of fruits and vegetables were frozen last year. Fruits constituted the larger part. The various types of containers used include the 50-gallon paraffin-coated barrel, 30-gallon barrel, and 10 and 5 gallon kegs. Large quantities are also packed in 5-gallon and in 10, 15, 30, and 50 pound tins. Small tins and paraffined-paper cartons have been used during the last three or four seasons. Over a million of these smaller containers will probably be packed during the coming season. Frozen strawberries, red and black raspberries, Logan blackberries, cranberries, peaches, apples, peas, string beans, spinach, and Lima beans are among the frozen fruits and vegetables now available commercially.

There are two general methods of freezing, slow freezing and quick freezing. In slow freezing, temperatures ranging from approximately 0° to 10° F. are used; in quick freezing the temperatures range from about $-10°$ to $-50°$. For quick freezing special equipment is necessary.

Work in the Department of Agriculture has been carried on in three phases: (1) Studies of the technology of freezing, (2) studies of the

varieties of fruits and vegetables best suited to freezing, and (3) studies of the transportation, storage, handling, and utilization of frozen products. Investigations on the technology of the various freezing processes, and their application to different products, have yielded new methods that should prove distinctly beneficial to fruit and vegetable growers. Fruit pulps of a new type made from tree-ripened fruits have superior flavor and can be used to obtain a product having a quality never before attainable in the manufacture of various fruit conserves, bakery products, and flavoring bases for ice cream.

Studies on the suitability of different varieties of fruit for freezing preservation, made largely by the Bureau of Plant Industry, have included observations on large numbers of containers packed with different varieties of the raw products. These studies show that some varieties are better adapted for freezing than others.

Studies made in the Bureau of Chemistry and Soils ou the possible dangers arising from the spoilage of frozen vegetables, showed that when these products were stored in an ordinary refrigerator for a few days, no toxin developed even in the presence of large numbers of botulinus spores. When defrosted peas were held at room temperature, however, toxin developed in some containers in which the products were spoiled. Every sample that contained toxin showed definite and unmistakable evidence of spoilage which would have been sufficient to prevent any consumer from utilizing the particular sample for food purposes.

Fruit Juices

The importance of fruits as food has led to many attempts to preserve fruit juices in more or less permanent and at the same time marketable form. Canning these juices has been indifferently successful, partly because of the reactions between the juices and the metal of the containers, but primarily because of the changes in flavor produced by the oxidation, the necessary heating, etc.

Recent studies have shown that some fruit juices can be frozen and preserved successfully for many months, but that the preparation and handling processes must be carefully controlled. The flavor of orange juice soon undergoes marked changes due to chemical reactions which are difficult to prevent unless air is removed immediately after the juice is extracted. By subjecting the juice to high vacuum, which is obtained with nitrogen gas, oxidative destruction of vitamin C is avoided and by packing the juice into sealed containers with nitrogen gas and freezing it rapidly the natural orange flavor and vitamins are well retained.

The preservation of fruit juices, particularly orange juice, by flash pasteurization, has received careful study, and promises to be highly successful. Experiments show that raising the temperature of orange juice very rapidly to just below the boiling temperature, and then cooling the juice equally rapidly, prevents subsequent microbial spoilage and also stops the deteriorative changes in color and vitamins. Packing the pasteurized juice in sterilized containers and sealing on the caps in flowing steam, yields a product which remains definitely and satisfactorily marketable over extended periods of storage.

Concentrated fruit juices have been successfully prepared in various forms. Orange juice, deaerated, concentrated under a vacuum, and sealed in glass bottles, has retained good color for many months. This type of product is used principally in the manufacture of beverages.

Another juice concentrate has been prepared by concentrating apple juice under a high vacuum, and packing it while hot into containers that are sealed immediately. Several excellent products have been made which could be used as sirups or, when diluted to proper strength, as beverages. The natural fruit flavors are remarkably well preserved. These concentrates represent a distinct advance in food preservation, and are not to be confused with the earlier products of this type. They have a distinct consumer appeal.

Full-ripened fruits make the best concentrates, and because the work can be done in factories located in the immediate vicinity of the orchards, this activity offers another promising means of utilizing surplus fruits which could not otherwise be marketed at a profit.

Dehydration

The preservation of foods by dehydration, or drying, which received special attention during the World War, has recently been revived as a cheap, convenient, and satisfactory means of carrying over surplus materials. An intensive study of the advantages of mechanical drying over sun drying has resulted in the development of the methods now used in dehydrating prunes, apricots, peaches, etc.

Attention has recently been turned to the possibility of preparing dehydrated fruit juices, vegetable pulps, etc. Theoretically, drying is the ideal method of preserving such products. The small weight of the dry materials and the ease and compactness of storing and handling, coupled with the great advantage of long storage with little or no change in character or flavor, make such a process highly desirable. For fruit juices the "spray-drying" process, carried out in an atmosphere of inert gas, is perhaps the most promising because these products are highly susceptible to oxidation or other deteriorative changes when exposed to the air.

Preservation by Fermentation

The processes used in preserving fruits and vegetables by fermentation date back to early historical times, but have never been fully studied. Recently, however, a study of the principles underlying these fermentations for the purpose of preventing spoilage has been made. The losses in the manufacture of cucumber pickles alone are relatively high, and at the present time the Bureau of Chemistry and Soils is working toward the elimination of spoilage in this product.

The methods of preparing and fermenting cabbage sauerkraut are being applied to new raw materials. Turnip sauerkraut has been developed as a commercial possibility, and because of its pleasing flavor and texture it promises to be popular.

The preservation of fruits and vegetables in salt solution is not only increasing but the process is being applied to new products which heretofore have been preserved in other forms or imported. For example, as over 7,000,000 pounds of the brined cherries consumed in this country are produced abroad, this field offers opportunities for developing a domestic product to replace the imported article.

The methods of fermentation used in the manufacture of cider vinegar are being applied to the utilization of cull and surplus fruits in the production of vinegars of various kinds. Rapid strides have been made in perfecting methods of clarification and sterilization, and thus

better and more salable products are assured. For example, when properly used, the filters now available should remove bacteria, yeasts, and molds, so that subsequent heat sterilization will be unnecessary.

Preservation by Canning

Commercial canning of fruits and vegetables is now done on a controlled scientific basis. In recent years new methods of processing known as "waterless canning" have been devised, one of which was developed in the Bureau of Chemistry and Soils. By these processes products of excellent flavor, closely resembling that of the cooked fresh materials, are produced. As these methods become more widely used consumption should be correspondingly increased.

Vegetables

Sweetpotatoes constitute the second largest vegetable crop in the United States. In 1931 the acreage was 778,000 acres, production was 63,000,000 bushels and farm value was $36,000,000. Because of irregularity in size and shape, rejection of a large proportion of the crop as culls is necessary to protect market grades. The proportion of culls has been estimated to range from as low as 10 per cent for the Jersey variety to approximately 50 per cent of the field-run crop of the Puerto Rico variety. It is estimated that not more than one-fourth of the sweetpotato culls are utilized.

The bureau has devised a method of producing starch of fine quality and uniform white color from sweetpotato culls, and recovery is as high as 18½ per cent of the weight of the potatoes. Laboratory examination, as well as test runs in cotton mills, indicates that this starch is suitable for sizing the warp and for finishing cotton goods.

During recent years as much as 28,000,000 pounds of potato starch have been imported annually into the United States for use in the domestic cotton-textile industry, and it is hoped that sweetpotato starch may displace the starch now imported for this purpose. The physical and chemical properties of sweetpotato starch and of modified starches and dextrines derived therefrom are being investigated with a view to finding other possible uses for these products.

After the starch has been extracted from sweetpotatoes there remains a residual pulp that contains valuable nutritive constituents, including a material proportion of starch which it is not profitable to recover. It is proposed to use this pulp as a carbohydrate constituent of mixed cattle feeds. A palatable and nutritious cattle feed can be prepared by mixing this pulp in suitable proportion with other materials, such as cottonseed, peanut and soybean press-cake meals, alfalfa meal, and linseed meal.

The development of a sweetpotato-starch industry would be particularly suitable for certain sections of the South, inasmuch as the raw material, sweetpotatoes, is available in territory adjacent to cotton mills; and the residual pulp could be mixed with other southern feed materials, such as those mentioned, for local use as a cattle feed. Since the area of production and a considerable proportion of the potential area of consumption are either identical or closely adjacent, the transportation costs of assembling the raw material and distributing the final products to consumers would be relatively low, which is a very advantageous circumstance. Utilization of cull sweetpotatoes in this manner would add materially to the cash income derived by farmers from this crop.

Light and Rancidity

Another phase of the work of the bureau on vegetables relates to the preservation of manufactured vegetable products. This work has shown that certain wave lengths of light (particular shades of green) retard the development of rancidity in such products as commercial potato chips. This effect of light also applies to such other oil-bearing foods as soda crackers, corn meal, shelled nuts, rice bran, rice polish, fish products, corn oil, cottonseed oil, butter, lard, wheat germ, peanut butter, etc. Commercial potato chips, with a value of $5,900,000 annually, are a very perishable product, and as at present wrapped and exposed on the market, are likely to become rancid and unsalable within a week. The trade practice which compels manufacturers to remove from retailers' shelves all potato chips over 3 or 4 days old, constitutes a serious commercial handicap. This bureau has shown that when the wrappings of potato chips exclude certain light rays, the product will keep fresh and usable for from two to three weeks.

Insecticides

Owing to the prevalence of insect pests on food crops, it is necessary to apply insecticides to nearly all fruits and vegetables. Attempts to cope with this problem raise many questions requiring investigation by the insecticide chemists of the department. Constant effort must be made to improve the known insecticides in order to adapt them to crops that need special treatment. For instance, lead arsenate is used on most fruits, but is not satisfactory for beans, and the action of calcium arsenate on many crops is too variable for practical purposes. New arsenical insecticides, namely magnesium arsenate, manganese arsenate, and materials similar to Paris green, have been investigated.

Chemical work has also been necessary in developing spreaders and stickers for insecticides, so that the best conditions for applying them to vegetables, and especially to fruits, can be attained.

The chief weapon used against the insects that destroy crops by eating the foliage or fruit, for example the cabbage worm and the codling moth, is arsenic in some form. Of the arsenical compounds, lead arsenate is used most extensively. Because both arsenic and lead are poisonous to man, it is necessary to develop some method of limiting the quantity of residue that remains on the edible portions of the crop at harvest time. Therefore, the department has expended unusual efforts in devising spray schedules that will leave low residues, in developing chemical-wash solutions and procedures for removing the residue that remains, and also in developing non-poisonous substitutes for the poisonous materials now being used. The last objective is of course the most important. Certain definite results have been obtained and great progress has been made. The compounds of fluorine have been studied, and some of them have been shown to have considerable value when used alone or when substituted for lead arsenate in the control of codling moth. Although these compounds are themselves poisonous, using them alternately with lead arsenate should lessen the danger from residues.

A world-wide survey of plants has been made in an effort to find additional insecticidal materials, and as a result the material called rotenone has been developed. In addition to showing promise as a substitute for lead arsenate this insecticide has been demonstrated

to be equal, or even superior, to nicotine (from tobacco) or the pyrethrins (used in insect powder) in the control of many sucking insects. Therefore, rotenone will supplement nicotine, which at present is relatively scarce and high-priced, and may possibly supplant pyrethrum, which is imported. The growing of derris and cubé, from which rotenone is obtained, may prove possible and profitable in some of the island possessions of the United States, and the recent discovery of rotenone in a common American weed (devil's shoestring) by one of the chemists of the department, at least suggests that this material is available in this country. Rotenone is harmless to man in any quantity likely to be left on sprayed fruits or vegetables and its use will constitute a forward step in solving the problem of spray residues. As the study of natural insecticidal materials progresses, the chemists of the department are continually preparing and having tested many organic materials which give any indication of being toxic to insects. From pyridine, a constituent of coal tar, a substitute for nicotine has been synthesized. This product, called neonicotine, has recently been found in a Russian weed and has become commercially available.

By-products and Wastes

The conservation of surplus stocks and the utilization of agricultural wastes by the recovery of valuable by-products or by manufacture of such wastes into useful and marketable products is receiving intensive study in many laboratories. Work in this bureau on the waxlike coverings of apples, pears, grapes, and cranberries indicates that certain components of these coverings can be recovered from such waste materials as peels and pomace. One fraction is ursolic acid, which is resinous and exceedingly water repellent; when combined with glycerin and phthalic anhydride, it forms an artificial resin which appears to add superior hardness and water resistance to lacquers. Another fraction is a low-melting hydrocarbon which has commercial possibilities if the cost of production can be made sufficiently low. It has been estimated that nearly 50,000,000 pounds of apple peels and pomace are produced each year, principally at canning, cider, and vinegar plants; from this material approximately 500,000 pounds of each of the two fractions could be recovered, if commercial demand for them could be stimulated.

Future Trends

In the utilization of fruits and vegetables one of the outstanding fields for future work is the development of satisfactory methods for preserving juices so that they will retain their natural flavors and nutritive properties. Another field offering considerable promise of future success is the industrial utilization of cull, waste, and surplus fruits and vegetables by means of fermentation, distillation, or other processes.

HENRY G. KNIGHT, *Bureau of Chemistry and Soils.*

RESEARCH Develops New Ways to Fight Pests of Fruits and Vegetables Conditions in nature undergo gradual but constant changes, and under the influence of civilization these changes are greatly accentuated. To meet them, entomological as well as other types of research bearing on orchard and truck-crop farm problems must be continuously devel-

oped. For example, control measures for insect pests, devised to meet one set of conditions, may become totally inadequate when these conditions are changed.

The development of agriculture in the United States, particularly during recent years, is in large measure responsible for the multiplicity and acuteness of insect problems. Crop production is becoming increasingly specialized, and localized in areas where conditions are considered favorable. Unfortunately, the concentration of a single crop in one area is extremely favorable to the well-being of insect pests. In many cases pests that were formerly of minor importance suddenly become pests of major proportions, because of the abundance of the food supply provided by man. For instance, the sugar-beet leaf hopper was not a pest of American agriculture until sugar-beet culture was started in the intermountain region and on the Pacific coast. Wireworms were unknown as a pest in the Northwest until reclamation projects got well underway. These pests formerly confined their activities to the moist river-bank land, but after irrigation began to be practiced they developed rapidly and spread over the whole irrigated area. Insect-pest problems have also increased with the development of the winter vegetable growing industry in the South.

With this increase in the abundance of insect pests has come also an increased discrimination, on the part of the consumer, as to the appearance of his green-food products. Blemishes on fruits and vegetables that were formerly accepted as a matter of course are now handicaps to the successful marketing of such products. This has resulted in the raising of insect-control standards, and has necessitated the improvement of old methods, or the development of newer, more effective controls.

With the outbreak of the Mexican bean beetle in the eastern part of the United States, it was thought that the generally used stomach poisons such as lead arsenate and calcium arsenate would be satisfactory remedies for this pest. Early large-scale tests with these materials showed that under certain climatic conditions these chemicals injured the foliage of the beans; consequently, it was necessary to search for a new remedy. The use of magnesium arsenate, a chemical that heretofore had been given but little consideration as an insecticide, was the result of this research. Control measures for the bean beetle have been worked out to meet conditions that obtain not only in the green bean growing area of the East but also in the dry-land bean farming of the West.

The pea aphid is a crop hazard with which the producer of peas, particularly the cannery crop, must deal. Research on direct control measures has been vigorously pushed for the last 10 years, but it has been concluded that this pest can not be controlled with existing insecticides, because of climatic conditions that prevail at the time the pest attacks the crop, and also because of the method of crop culture. Reduction of loss from this pest perhaps will come from an increased knowledge of pea culture, including the development of varieties more or less immune from attack.

Losses to Beet Growers Reduced

An extensive and intensive investigation of the sugar-beet leaf hopper has resulted in reducing losses to sugar-beet growers from attacks of this insect. A study of the factors affecting the overwintering of this

163050°—33——24

insect has made it possible to predict leaf-hopper conditions during the next season. During years when leaf hoppers are not expected to be abundant the growers may therefore plant an extensive acreage of beets with the assurance of an excellent crop, whereas during years when the outlook is for large populations of leaf hoppers they may plant some less susceptible crop. In California the spraying of the wild host plants of the leaf hoppers in the fall after the pests have left the cultivated fields gives promise of reducing losses not only of sugar beets but of certain vegetable crops that are affected by the leaf hoppers.

The introduction of the pepper weevil in the pepper-growing areas of California threatened the successful production of this crop. Control measures that have been developed consist of dusting with calcium arsenate, in a manner similar to that used against the boll weevil, and cleaning up the winter hosts of the weevil. Calcium arsenate leaves an objectionable residue on the pepper fruit, but this residue can be removed by washing. Good results are obtained if the peppers are carefully dried directly after they are washed; otherwise they are liable to attack by destructive molds and rots.

The celery leaf tier, while generally considered a temperate-climate insect, became a major pest in California and Florida with the increase in acreage devoted to the production of winter celery. A careful study of this pest and methods of controlling it has resulted in successfully combating it with a pyrethrum-tobacco dust applied against the immature celery leaf tiers. The effective control of this insect depends upon a thorough knowledge of its habits and seasonal history.

Wireworms, both on irrigated lands and elsewhere, represent one of the more important problems. Extensive research in the control of these pests is being conducted, and soil fumigation with carbon disulphide, calcium cyanide, and naphthalene has shown some promise as a means of reducing losses. Flooding and crop rotation may also be useful. Fallowing to starve the wireworms is useful in the dry-farming areas.

More recently the Puerto Rican mole cricket and another introduced species have caused considerable damage to the vegetable crops in the winter producing areas, particularly Mississippi, Florida, and on the Atlantic coastal plain in North Carolina and South Carolina.

Potato growers on the eastern coastal plain have suffered losses from sporadic outbreaks of the seed corn maggot, which attacks the seed pieces shortly after they are planted, causing poor and weak stands. Investigation revealed that the maggot did not attack uncut potatoes, or cut potatoes of which the cut surface had been thoroughly corked over before planting. Methods of suberization, or corking over, before planting have been developed; the grower can use these methods with facilities that are available and with only a small outlay of money.

Flea beetles cause serious losses each year in cigar-wrapper tobacco-growing districts of Florida. Recently barium fluosilicate has been used very successfully and is far superior to any material heretofore developed for the control of this pest.

Bordeaux mixture, while ordinarily used as a fungicide, is entirely satisfactory in the control of the potato leaf hopper and the disease called "hopperburn" which is caused by this pest. Recent developments indicate that the copper in the Bordeaux mixture is absorbed

by the plant and that the leaf hopper obtains a toxic dose of copper by feeding on the juices of the treated plant.

The San Jose scale refused, 10 or 12 years ago, to yield to treatments of lime-sulphur that previously had been found fully effective. Hundreds of acres of apple and peach orchards in some portions of the Middle West were killed by this scale before it was found that complete control could be obtained by using low-strength emulsions of certain low-priced lubricating oils. Experiments conducted by the Bureau of Entomology, as well as by State organizations, were followed by the prompt adoption of oil sprays by most of the growers, who were thus enabled to deal very effectively with the pest. Further work is being done with oil sprays in order to strengthen the knowledge of their use and their effect.

Some Insects Resist Insecticides

Certain serious insect pests have refused to yield readily to the ordinary insecticide treatments. Prominent among these is the oriental fruit moth, similar to the codling moth, which attacks peaches and most other fruits. This pest found its way to the United States shortly after 1910, and is now of major importance in most of the peach-growing areas east of the Rocky Mountains. Because there are no adequate insecticide treatments, attention has been given to the possibility of controlling the pest by biological means, that is, by parasites and predacious insects. In some eastern areas the fruit moth is held in partial control by several native parasites, particularly by one known as *Macrocentrus ancylivorus* Roh. In order that this parasite may be of assistance to growers in other localities, the bureau has reared it in large numbers from material collected in New Jersey and, in cooperation with State organizations, has established colonies in many of the important peach-growing areas where the fruit moth occurs. Recovery collections at some of the points of liberation have already given extremely encouraging indications, and it is expected that important benefits to the peach industry will result, although complete control by parasites can not be expected. The bureau has also imported parasites of this species from their native home in the Orient as well as from infested areas in France and Australia.

The occurrence of the Mediterranean fruit fly in Florida a few years ago was an instance of a serious outbreak of an accidentally introduced foreign insect. Coincidentally with the successful eradication campaign carried on by the Bureau of Plant Quarantine and Florida State agencies, the Bureau of Entomology conducted intensive investigations and developed a control program that materially contributed to the success of the eradication campaign. With successful conclusion of the eradication campaign, the investigations were transferred to Hawaii, where the fruit fly has been established for a number of years, to complete studies under way and to obtain fuller information in the event that this pest should reappear within the continental United States. Work on related fruit flies which occur in South America and Central America is being conducted in Mexico in cooperation with the Mexican authorities, in order that information on the eradication or control of these pests may be available should they at any time be found within the United States.

Although stomach poisons, such as the arsenicals, were formerly widely recommended and used in the control of practically all the leaf-feeding insects, it is recognized that danger to the consumer attends

the careless use of these poisons on crops with edible foliage and on certain fruits. An immense amount of work has therefore been done within the last few years in an effort to eliminate the use of an arsenical or other poisonous material. In the organic-insecticide field, in a search for a material nonpoisonous to man and at the same time poisonous to insects, pyrethrum and extracts of derris have been widely tested. Considerable further work is necessary to determine the exact extent to which these materials can be used in insect control.

Another phase of this investigation has been on the use of attractive baits against the adult forms. Probably one of the most outstanding developments is the use of amyl salicylate as an attractant in conjunction with tartar emetic as a poison against the moth of the tobacco hornworm. The exact value of this method has not yet been determined, but indications are that the use of arsenicals on tobacco plants in the control of hornworms can be materially reduced by killing the moths with the poisoned-bait feeders.

The possibility of controlling the oriental fruit moth by means of bait traps has also been given considerable attention. In this case the moths are attracted to the bait materials—usually fermenting sugar or molasses solutions to which an aromatic chemical has been added. The moths fall into the liquid, get their wings wet, and are unable to escape. Large-scale experiments were conducted in two localities during 1930 and 1931. In each of these experiments 400 to 500 acres of peach orchards were baited throughout the season. The results indicate that it is possible to reduce the fruit-moth infestation 50 per cent or more by the use of the bait traps. Because of economic conditions, however, this practice has not as yet been adopted by growers. In addition to the data on control, much information on the migration habits of the moths was obtained.

As a supplementary measure for the control of the codling moth, which is increasingly difficult to combat by spraying, the bureau has developed a device known as the chemically treated band. On leaving the apple, the codling-moth larva, or worm, searches for a sheltered crevice in which to spin its cocoon. By scraping the loose bark from the tree and removing other possible hiding places, it is possible to force a considerable percentage of the worms to go into bands of corrugated paper or other material placed on the trunks of the trees. These bands are treated with certain chemicals, which kill the larvae seeking refuge there. The chemically treated bands promise to play an important part in controlling severe infestations of the codling moth.

B. A. Porter *and* W. H. White, *Bureau of Entomology.*

THE FARM BUSINESS and THE FARM HOME

FARMERS Resourceful and Prompt in Making Needed Readjustments Farmers have been prompt and resourceful in making readjustments during the depression. Three classes of such readjustments are to be noted: (1) In the *organization and operation of farms;* (2), *in the family living;* and (3), in community activities and relationships.

The American farmer has always been characterized by a spirit of independence. It is this characteristic which has lent so much color to the pioneering period in the development of American agriculture. Although the present situation is less dramatic and picturesque than pioneer days, it requires no less perseveranee, originality, and courage. Farmers have faced, and are still facing, a price situation that means drastic reduction of income.

The various types of adjustment that are in evidence on individual farms in the present emergency seem naturally to drop into five classes, as follows:

(1) Adjustment of the program of production; that is, changes in the amounts and proportions of the various things produced.

(2) Adjustment in the cost of production to meet a condition of diminishing farm income.

(3) Efforts to maintain soil fertility, permanent farm improvements, and farm equipment with a minimum of cash outlay.

(4) Efforts to increase farm efficiency.

(5) Modifications in financial management.

Reshaping the Farm-Production Program

To determine just what crops and livestock he will produce is, of course, the job of each individual farm operator. His motive is to make the most money he can or, more accurately speaking, to get the most, both in money and nonmoney returns, from his productive resources. True, this is not the only motive that aetuates the farmer. He is interested in living and enjoying himself and in meeting his responsibilities as the head of a family and as a member of a community. These responsibilities do not all take an economic direction, but they modify the purely economic motive as it affects the use he makes of his farm.

Assuming that the most powerful motive in shaping the farmer's production program is his desire for gain, the question of just how he determines what will give him the greatest return, arises. There is, first of all, the market demand for his product as reflected in the priees he

can get. The relative prices obtainable for the various commodities are the farmer's index of what consumers want and what, other things being equal, it will pay him best to produce. Nevertheless, his returns are conditioned not alone by price but by the relative effectiveness with which he can produce the various products or combinations of products. He himself, his equipment, and his land are not equally fitted to produce all of the commodities for which there is a market. So far as money income is concerned, it is net income, rather than gross, which is important. The farmer must hold both prices and costs constantly in view in determining this important part of his farm organization.

It is largely from the cost side, with relation to the full use of his resources, that the farmer must consider a combination of products rather than only one. Two important considerations are involved. The first is to obtain such a combination of enterprises as will make for the fullest utilization of his land, his labor time, and the use of his equipment and power. No crop or class of livestock takes a constant amount of attention. Their labor and power demands are seasonal and they may require different kinds of land. Therefore, the farmer must combine a number of enterprises in order to make the fullest use of all his resources. The second consideration is that certain lines of production help to make the products from other lines more valuable. Feed crops normally become more valuable by being fed to livestock. Many enterprises on the farm produce what the manufacturer would call "goods in process." These goods must be further used on the farm before they will bring a maximum return.

Fundamental Changes Produced

A major economic movement, such as the present depression, fundamentally changes the situation that confronts the farmer in working out his production program. For many farmers one commodity, which formerly did not pay as well as another, now assumes a position of superior relative profitableness. Such changes also affect costs and the relation of costs to the gross income from products. Altogether, a major change in prices, such as we have been passing through, particularly in the last three years, is cause for considerable change in the production programs on many farms.

Price reduction, as a composite movement, reduces the margin between costs and prices, or renders this margin negative, very largely because costs do not fall in concert with prices. All this means that the farmer must take his bearings anew and search for adjustments that may help him to escape the worst effects of the depression. One of the most important adjustments which usually takes place under such circumstances as have recently prevailed is a partial shift from production for sale on the market toward production of things for direct consumption on the farm. Food crops and feed crops are likely to be increased at the expense of cash crops.

In many cases, a curtailment of production as a whole is the result. It frequently happens that a limited volume of product can be put on the market with minimum disadvantage in a low-price period, whereas additions to this minimum involve direct cash outlays which the low prices will not justify.

For the most part, such changes as have been made are manifesting themselves in the general statistics of crop and livestock production.

Table 12 indicates the changes in acreage of the most important cash and feed crops during the years 1928–1932. This period is selected as covering the transition from the somewhat stabilized economic conditions preceding the present acute phase of the depression and carrying through the years of severe depression to the present.

TABLE 12.—*Estimated acreage of the important cash and feed crops in the United States, 1928–1932* [1]

(In thousands—i. e., 000 omitted)

Crop	1928	1929	1930	1931	1932 [2]
Wheat	58, 272	61, 464	59, 153	55, 209	55, 414
Cotton	45, 341	45, 793	45, 218	40, 693	36, 161
Tobacco	1, 894	2, 040	2, 110	2, 030	1, 447
Corn	100, 673	97, 856	100, 829	105, 100	108, 609
Oats	41, 734	40, 043	41, 589	39, 719	41, 994
Tame hay	58, 140	60, 205	58, 473	55, 771	52, 424

[1] Figures from the Crop Reporting Board.
[2] Preliminary.

Trend in Main Export Crops

The most important changes indicated by the table are those in wheat, cotton, and tobacco acreages. In all of these, the American farmer has found a market for a larger or smaller proportion of the crops through export. Referring first to the wheat figure, no sweeping change in the last two years is noted. It should be explained that these figures represent the areas harvested and do not take into account the acreage abandoned as a result of either winterkilling or drought. After a maximum acreage for the five years was reached in 1929, there was a reduction of approximately 4 per cent in 1930, and another reduction of 6 per cent in 1931 below the acreage harvested in 1930. On the whole, there seems to have been a surprisingly small reduction of wheat acreage in view of the extreme decline in the price of wheat. This retarded adjustment is probably accounted for very largely by the fact that no other more promising crops seemed available, and the fact that the time has been too short to permit an actual retirement from such of the wheat area as, in the long run, may be abandoned unless prices recover substantially.

The adjustment in cotton has been considerably greater. There was a reduction of 10 per cent in 1931 below the acreage of 1930, and in 1932 an additional reduction of 11 per cent below the 1931 acreage. In only a minor way is this reduction accounted for by abandonment of cotton land. Most of it is caused by a shift to other crops, particularly corn and minor feed crops. This movement is normal in view of the drop in the price of cotton. Such changes have occurred many times before. There are many reasons why cotton farmers seem to respond more promptly than wheat farmers to reduction in prices. They find it to their advantage to raise more and buy less of their livestock feeds when cotton prices are low. Since in cotton production there is a considerable amount of cash outlay for fertilizer purchases and hired labor, it is somewhat more economical to leave the poorer cotton land out of production than is probably true with reference to similar wheatlands. However, these reductions do not indicate any fundamental change in the cropping systems of the South.

It is in tobacco acreage that the biggest reaction has taken place. With almost 50 per cent of the United States tobacco crop in recent years going abroad, the international phase of the depression exerted a major influence upon the price of tobacco and declines have been very severe. These were felt particularly in the season of 1931. That year's acreage was only 4 per cent below that of 1930 but the acreage of 1932, as indicated by the preliminary estimate, represents a reduction of 28 per cent below the acreage of 1931.

Tobacco is grown under a very wide range of conditions and in widely differing relations to the other crops of the farming system. However, in most areas it occupies only a minor fraction of the crop land. Therefore a sweeping reduction in its acreage can be made without very seriously affecting the other elements in the cropping program. However, since tobacco takes a large amount of labor, the adjustment does affect the labor program of the farmer. To the extent that the special labor used upon tobacco must be hired, the price has a major influence. It is in those areas where the fall in the price of tobacco has rendered cash expenditure for fertilizer and labor in tobacco production unwise that the heaviest scaling down is found.

Many other examples of substantial adjustments in acreage might be cited from the minor crops, such as potatoes, vegetables, and small fruits.

Corn, oats, and hay are the great feed crops of the country. They are, therefore, closely related to the livestock enterprises. The movement in the acreage of these crops presents some surprising contrasts. In general, the production of concentrated feed, of which corn is the most important crop, has increased, while the production of hay, as reflected by the tame-hay acreage, has decreased.

It is altogether likely that the shrinkage in hay acreage since 1929 is not the result of farmers' deliberate intent, but rather of adverse weather conditions. In general, price relations have stimulated expansion of livestock enterprises, sometimes as an addition to the normal amount of crop production and sometimes as a partial substitute for cash crops. The increase in the acreage of corn is accounted for very largely by the shrinkage in acreage of cotton in the South. No very significant change in the acreage of oats has taken place.

The acreage of all feed grains has changed relatively more in other regions than in the Corn Belt. It seems evident that the expansion in feed crops, indicated in Table 12 and by other figures on the minor-feed-crop acreages such as barley and sorghums, has been made not so much as a substitute for other corps in the principal feed-crop-producing regions, but rather as a means of reducing costs in other regions.

Changes in Livestock

Changes in feed-crop acreages are naturally associated with changes in livestock on the farm. Table 13 presents the estimated numbers of the important classes of livestock on farms on January 1, from 1928 to 1932, inclusive. These figures show that cattle and sheep have been increasing during the last five years. Hogs decreased in number up to 1931, but that year showed an increase, as evidenced by the number on hand January 1, 1932. Poultry on farms has shown a slight tendency to increase although there was a decrease in 1930, reflected by the January 1, 1931, figures. The evidence indicates that the increase was resumed in 1931 and is reflected by the number on farms early in 1932.

TABLE 13.—*Estimated number of livestock on farms of the United States on January 1, 1928–1932*

[In thousands—i. e. 000 omitted]

Kind of livestock	1928	1929	1930	1931	1932
Dairy cows	22, 129	22, 330	22, 910	23, 558	24, 379
Other cattle	34, 572	35, 548	36, 820	37, 357	38, 028
Sheep	45, 121	48, 249	51, 383	52, 745	53, 912
Hogs	61, 772	58, 769	55, 301	54, 374	59, 511
Chickens	463, 364	444, 481	470, 463	459, 402	....

The cattle enterprise with its two main branches, beef production and dairy production has been on the increase. The two branches are closely related only in certain parts of the country. In the Northeastern States the cattle enterprise is almost entirely dairying. In the grazing areas of the Western States, and in portions of the Middle West, it is almost entirely beef production. Over much of the Middle West, however, the cattle enterprise is a dual one, meat animals and dairy products being marketed from the same herds.

The combined number of all classes of cattle in the country has moved in well-defined cycles of from 12 to 14 years in length. However, the number of cattle classed as beef has varied much more sharply in these periodic movements than has the number classed as dairy cattle. In general, the number of dairy cattle has been increasing steadily ever since the World War, whereas the number of beef cattle diminished considerably during the first half of the last decade and has been increasing again since 1928. These recent increases in beef cattle have occurred in the Middle West rather than in the grazing areas. They have been accompanied by an increased use of beef-type and dual-type cattle for dairying purposes. This is probably a normal evolution, but has been accelerated by the low prices of other products. Farmers of the Corn Belt who have in the past obtained most of their income from the sale of hogs and beef cattle fed on the corn, hay, and other feeds produced locally have found their returns from these sources shrinking alarmingly and have sought supplementary sources of income. It has not been so much a shift from meat production to dairy production as it has been an adding of the dairy enterprise as another source of farm income. The same development, to a less conspicuous degree, has been taking place in the eastern portion of the wheat region and, lately, in the Cotton Belt.

The sheep figures show a substantial increase in numbers during the entire 5-year period. This has come in spite of unfavorable prices, partly from momentum and partly because the price situation did not encourage a sharp reduction through sales, such as might usually be expected after a sustained period of increase. During the season of 1932 the prices of sheep and lambs, as compared with those of other classes of livestock available in the areas of heaviest sheep production, have been such as to discourage the replacement of sheep with other classes of livestock.

During most of the 5-year period represented in Table 13, the hog industry of the country has been on the declining phase of the production cycle. It is characteristic of the hog industry that the number on farms should decline through a period of three or four years and then increase because of the added price stimulus that comes from declining numbers. The number of hogs on farms on

January 1, 1932, indicates that the decline came to a close in 1931. Current figures on farmers' intentions to breed seem to indicate that the upward trend in number of hogs that began in 1931 is still under way in spite of the extremely low prices which farmers have had to take for their hogs during the last season.

Poultry has played a rôle somewhat similar to that of the dairy enterprise in this period of depression. It has been resorted to as a means of augmenting dwindling incomes on many farms. It has also afforded a means of reducing current expenditure for food. On the other hand, specialized producers of poultry, whose costs are very largely in cash, have found prices in this depression disastrously low and the volume of production by such producers, particularly in the west coast States, has fallen.

In general, the price situation has stimulated the production of livestock because feed crops are relatively cheaper than livestock and livestock products. Certain lines of animal production, such as dairy and poultry, have been further stimulated by the live-at-home program and by the desire of many farmers to add to their normal sources of cash income some new sources with a minimum of cash outlay and a maximum utilization of otherwise unmarketable or extremely low-priced products.

Changes in Production Costs

The first question that occurs in reducing costs to meet falling prices is whether such a reduction can be made without a corresponding reduction in the volume of output. Costs automatically drop somewhat in a low-price period because prices of the things the farmer buys to use in producing goods, respond, although somewhat sluggishly, to the same forces that reduce the prices of farm products. But this is not the only way in which costs are reduced in such an emergency as the present. Certain cash outlays that will increase the output somewhat, may be justified in periods of high prices but are found unjustified in periods of low prices because the added product is not worth the added cost. Farmers are fairly prompt in eliminating this sort of expenditure. This response is reflected in the reduced purchases of fertilizer, of feeds, and of new machinery, and in less hiring of labor.

The costs of farm production may be classified in several ways. For example, there are cash costs and noncash costs. The labor obtained from hired help represents a cash cost while that which the farmer and the members of his family furnish is a noncash cost. The farmer reacts differently to these two types of labor cost under changing price conditions. He considers the feed that he must buy in the market in a different light from that in which he considers the feed he raises on his own farm and for which there is not, as in the case of pasture and some classes of hay, an immediate cash market.

Current and Long-Time Outlays

There is, further, a significant distinction to be made between cash outlays that are made for and concern only the current year's production, and those that are long-time investments. The latter, when once made are irretrievable except by the use of the things that were bought. For example, the fuel and oil for the tractor is used in the immediate operation of plowing this year's crop land, but the purchase price of the tractor itself may have been expended three years

ago and can not be recalled. The farmer may save on fuel and oil expense by being more sparing in the work he does on his crops. In a time of low prices he may freely draw for his current production on those things that represent past investments, because in many cases their use would be lost to him unless he does use them currently. He may well question, however, the wisdom of making unstinted immediate expenditures for labor, fertilizer, and fuel.

The group of long-time or fixed investments in farming is large. The land which the farmer owns, the improvements he has built upon it in the past, the machinery he has bought in previous years, the work stock and breeding stock he has on hand, all belong in this category. Their use is controlled by a set of considerations different from those that prompt him in making his immediate cash outlays.

It is the farmer's problem, so far as the cost side of his managerial job is concerned, to work out and carry through a program of production that will bring him the largest returns both in money and in direct personal benefit from the use of these different classes of resources. These resources include not only things that represent past investments, but also his own labor and that of this family, and certain amounts of cash and credit. His labor and his cash and credit represent flexible elements in his costs. It is in their use that he can make his quickest and most radical adjustments in an emergency period such as the present.

Some Cash Expenditures

There is evidence of such changes in American agriculture now. Table 14 shows the estimated cash expenditures of the farmers of the United States for certain outstanding items of costs for the years 1928–1931. According to the Federal census the largest single item of expenditure by farmers in 1929 was for labor. Approximately $955,-500,000 was spent for this item. The next most important was feed, requiring an expenditure of $919,000,000. The third item in importance was for equipment and machinery, including automobiles and trucks. This amounted to $692,500,000. Fertilizer came fourth with an expenditure of $271,000,000. Electric current purchased from power companies for light and power amounted to only $48,500,000. The census contains no data on the expenditure of farmers for several other important items. Probably the most important of those omitted is the purchase of livestock. Another very important item, particularly in some regions, is fuel and oil for tractors, trucks, automobiles, and stationary engines.

TABLE 14.—*Estimated expenditures by the farmers of the United States for selected means of production, 1928–1931*

[In millions—i. e. 000,000 omitted]

Kinds of expenditures	1928	1929	1930	1931
Wages (including board)	$1,147	$1,195	$1,036	$805
Feed	897	919	805	590
Fertilizer	273	271	268	216
Farm implements (excluding autos and trucks)	508	578	480	267
Other farm machinery and the cost of its operation	918	885	786	619

Table 14 indicates a reduction in the expenditure for labor of only 5 per cent from 1929 to 1930, but of 12 per cent from 1930 to 1931. Feed

purchases fell by 12 per cent and 27 per cent respectively in the same two years. Corresponding reductions in the expenditure for fertilizer were 1 per cent and 19 per cent. Reductions of 17 per cent and 44 per cent were made in the expenditure for farm implements.

The figures just cited are all in terms of money and hence are affected not only by decreases in the volume of things used but by the fall in prices. There have, of course, been substantial reductions in the actual physical quantities of cost goods and services used by American farmers. Table 15 contains an estimate, based upon fairly adequate data, of the number of tons of fertilizer bought by the farmers of the United States from 1929 to 1931, inclusive, and the average for the 5-year period 1925–1929. The figures indicate that the Southern States, including both the South Central and South Atlantic, are by far the heaviest users of fertilizer. The Middle Atlantic States come next, with the North Central States third. The reduction in the tonnage of fertilizer used in the two years that have marked the most extreme downward movement in agricultural prices is well brought out by the figures for 1930 and 1931. Returns from those States which levy a tax on fertilizer indicate that for the first six months of 1932 there was a further reduction in the purchase of fertilizer of 61 per cent below the amount bought in the same months of 1931. These States include 13 Southern States, together with several Corn Belt States. It is evident, therefore, that the use of fertilizer has been greatly reduced by low prices of farm products.

TABLE 15.—*Estimated number of tons of fertilizer used, by regions, in the United States, 1925–1929 average, and by years, 1929–1931*

Region	1925–1929 average	1929	1930	1931
New England	353, 125	357, 465	372, 219	357, 594
Middle Atlantic	995, 083	1, 067, 188	1, 086, 000	955, 939
South	5, 177, 127	5, 516, 970	5, 614, 500	4, 100, 351
North Central	852, 787	962, 148	952, 178	754, 512
West	136, 027	174, 777	187, 179	171, 105
United States	7, 514, 149	8, 078, 548	8, 212, 076	6, 339, 501

Corroborative Data From Management Studies

The evidence presented by these general figures is corroborated by figures of limited scope derived from certain farm-management investigations. Table 16 shows how farmers in central Indiana reacted in the use of fertilizer, in percentage of wheat and corn acreage fertilized and the rate of fertilizer application.

TABLE 16.—*Use of fertilizers by 77 farmers in central Indiana, 1929–1932*

Year	Wheat		Corn	
	Area fertilized	*Quantity* applied per acre	Area fertilized	*Quantity* applied per acre
	Per cent	*Pounds*	*Per cent*	*Pounds*
1929	98	153	51	112
1930	97	156	53	96
1931	96	158	45	88
1932	87	123	12	68

Similar reactions are shown in Table 17, derived from a field study in southeastern Michigan. Here there is a marked difference in the application of fertilizer as between crops sold on the general market and crops sold on contract. Wheat, barley, oats, and corn all received much less fertilizer in 1932 than in 1930; while sugar beets and tomatoes, which were sold under contract and hence did not suffer such a heavy price decline, show no such diminution in the rate of fertilizer application. This is concrete evidence that farmers are adjusting their cash expenditures in the light of expected prices. Similar reactions occur in practically all parts of the country where farm-management investigations are yielding data with which to measure such reactions.

TABLE 17.—*Commercial fertilizer applications in southeastern Michigan in 1930–1932, by crops, quantity, and cost per acre*

Crop	Average application per acre			Average cost per acre		
	1930	1931	1932	1930	1931	1932
	Pounds	*Pounds*	*Pounds*	*Dollars*	*Dollars*	*Dollars*
Wheat	173	131	109	3.05	2.37	1.81
Barley	105	70	25	1.76	1.08	.39
Oats	89	60	23	1.47	.97	.36
Corn	65	37	15	1.14	.61	.23
Navy beans	109	41	34	2.07	.78	.61
Soybeans	111	7	2	2.70	.11	.03
Sugar beets	219	104	247	4.00	3.31	4.35
Potatoes	527	343	145	11.22	6.40	2.54
Tomatoes	437	440	412	8.30	9.16	7.74

All data indicate that farmers are reacting toward cash expenditure for labor in the same way as toward cash expenditure for fertilizer, although the reduction is not so sharp. Table 18 shows the average number of hired laborers per farm on the farms of crop-reporting farmers, as reported to the Division of Crop and Livestock Estimates for 1928–1931. As a result of dwindling cash income there is some reduction in the amount of labor hired. Similar figures on the amount of farmer and family labor used on these same farms are available. They show no consistent reduction.

TABLE 18.—*Average number of hired laborers employed per farm by crop reporters, by regions, 1928–1931*

Region	1928	1929	1930	1931
North Atlantic	0.99	0.98	1.01	0.99
North Central	.62	.39	.54	.52
South Atlantic	1.89	1.90	1.67	1.59
South Central	1.48	1.59	1.50	1.37
West	1.60	1.56	1.68	1.66
United States	1.13	1.14	1.08	1.03

All available figures show that farmers are economizing in cash purchases of feeds. Figures on the amount of feed used for dairy cows, gathered monthly by the Bureau of Agricultural Economics, indicate a rate of feeding lower in 1932 than in previous years. Figures on the sales of commercial feeds such as cottonseed, linseed, and soybean meals, and feeds derived from flour milling, all show a sharp reduction in farmer purchases. Similarly, all farm-management

investigations that involve figures on cost outlays indicate a reduction in the expenditure for feed. An interesting example of this is drawn from southeastern Michigan where a considerable increase in the production of alfalfa is resulting in substitution of alfalfa hay for high-protein feeds previously purchased. In many parts of the country, farmers tend to shift their hay production to quick-growing legume crops that will supply a higher percentage of protein than the mixed hays normally grown. A counterpart of this same reaction is, of course, the shift to a larger acreage of feed crops in the Cotton Belt and in other parts of the country where, under normal conditions, a large portion of the feeds used was bought rather than raised on the farm.

Savings in Fuel and Oil

Although no comprehensive figures on the amount of savings resulting from diminished purchases of fuel and oil are available, it is known that such savings have been considerable. In southwestern Kansas it was found that farmers in fitting their seed beds for wheat in the fall of 1931 performed fewer operations such as disking, harrowing, and the like, in order to avoid expense in operating outlay. It was reported that in many parts of the country where horses are still numerous, farmers have laid aside their tractors, or have used them a much smaller number of hours, thus sacrificing the advantages of more rapid work, and in some cases more thorough cultivation, in order to save cash outlay in operating these machines. In some areas there is a decided tendency to reduce the cost of hired truck service, by hauling with horses and spreading the hauling period for crops over a longer season, thus reducing another item of cash outlay. Similar reactions are very general in repairs on machinery, fences, and buildings. It has long been known that the use of paint on farm buildings rises and falls regularly with the price level of farm products.

To summarize this discussion of farmers' adjustments of costs, it may be said that there has been a decided shifting away from cash expenditures and, so far as possible, a substitution of things that can be supplied from the farm or by the farmer, for such means of production as previously were bought. In many cases this sort of adjustment has resulted in poorer cultivation and it may be expected that it will result in poorer yields, although in the last two years favorable weather has gone far to compensate for the lack of better cultivation and more fertilizer. In some cases this shearing off of costs has meant some reduction in the scope of operations although apparently to only a minor extent. No farm-management project shows any significant reduction in the size of farms or in the general scale of operations upon these farms. These projects do show, unmistakably, a sharp reduction in cash costs.

Maintenance of the Farm Plant

Closely connected with the problem of adjusting operating costs in the production of individual farm commodities is that of maintaining and building up the farm itself. This problem is particularly difficult during periods of agricultural depression. In such times there is little new capital available from current net receipts and there is great doubt of the wisdom of any sizable investments in renewals, upkeep, and expansion because of the uncertainty about the length of the depression and about the farmer's ability to repay loans or to get

value received from the improvements made. On the other hand, the tendency to permit the plant to run down in such periods is unfortunate. There is unavoidably a great deal of waste because postponing repairs and replacements frequently leads to greater deterioration and, therefore, more expense in the long run than if they had been promptly attended to. It is, therefore, part of the farmer's problem to find means of keeping up the land and equipment improvements, as far as possible.

In a period of low prices the problem of soil fertility is tied up closely with the investment in fertilizer as a part of the current cost of producing crops. Most fertilizers have a residual effect and investment in them becomes a part of the more or less permanent farm capital. Some of this residual effect lasts over a long period, as, for example, the application of lime. It is particularly unfortunate if a period like the present should result in a serious depletion of the normal stores of plant food in the soil and if the usual plans for maintaining the productive power of farms by draining, preventing erosion, and other means, should have to be abandoned or sharply curtailed.

Fortunately, the building of terraces and other means of preventing erosion can be done very largely by the use of teams, implements, and labor already on the farms, and at times when crop operations are not making urgent demands. It has always been the practice of better farmers to make these improvements in this way; and there is probably nothing new in the way of readjustments required here except make the practice more general as the need is more keenly realized.

Again, the cropping programs on many farms can be rearranged to include a soil-building legume crop and thus contribute to the maintenance and even the increase of fertility. The best farm practice has always included this sort of element in the cropping program, but too frequently it has been omitted because of a desire to use all of the land for immediate pecuniary returns. The benefits of such crops as sweet-clover, lespedezas, and other soil-building legumes are more and more appreciated by farmers, who are making increasing use of soil-building crops in order to increase the humus and nitrogen supply and put the soil in better physical condition and thus prevent erosion. Fortunately, this type of soil improvement can be included in the year's farm operations with very little actual cash outlay.

More serious, from a financial standpoint, is the problem of maintaining buildings and fences. Repairs of this sort normally require cash outlay at least for the necessary materials. But here again farmers are finding ways to meet the most acute needs without heavy cash expenditures. On many farms fence posts can be obtained from the farm wood lot or from near-by timber at only the cost of the labor necessary for their cutting. In time of better prices posts and other materials might have been bought; but with diminishing income farmers are finding the makeshift very acceptable. Such materials are of only limited use in repairing buildings. Nevertheless, on many farms secondhand material can be used and is being used for making the most urgent of such repairs.

Upkeep Often Unavoidably Neglected

Under present conditions very few farmers find it possible to invest money in the paint required for normal repainting, which inevitably must be neglected on many farms. While the resultant loss is consid-

erable, painting appears to be one type of expenditure that can be temporarily postponed with the least serious results.

In the present situation farmers should consider the present low cost of building materials. While, for most farmers, this is no time for new major commitments even though building materials are cheap, there are cases in which cash or credit is available and in which the future usefulness and profitableness of the improvements are unquestionably assured by renewal and upkeep measures.

Another plant-maintenance problem is the replacement of implements and machinery and the repair of such as are already on hand. A machine such as a plow, tractor, or binder is ordinarily kept in service with such repairs as are needed, until its condition renders its service more expensive and less productive, all things considered, than that of a new machine. But the point at which a farm implement is, economically speaking, beyond repair, differs, of course, with the price of the machine required to take its place and the price of the commodity in the production of which it is to be used. It may pay to buy a new binder to avoid delay in harvesting a wheat crop worth $1 a bushel, but extremely unwise to buy it to cut wheat that will sell for only 25 or 30 cents per bushel. The same considerations apply to replacing older types of machinery, not necessarily worn out, with newer types of improved model and higher efficiency. Many farmers are delaying the purchase of corn-picking and grain-harvesting machines that would save labor and, in normal times, increase the total net profits of the farm, simply because under present price conditions it would be unprofitable to make the shift.

That farmers are thinking carefully along these lines is evidenced by their reactions. The following excerpt from a letter from a field man on a farm-management project in Texas illustrates the adjustments that farmers are actually making in this respect:

> Farmers in the area have been hedging in many ways this year. Early in the season, I was sure a number of the cooperators were omitting expense items from the records. I was sure there should be more repairs, plow points, blacksmithing, new sweeps, etc., and would question them. Invariably they would say they just were not buying things and were doing their own sweep sharpening, etc., until I decided that probably the record books were more complete than they appeared to be.

Maintaining good livestock on the farm, even in a period such as the present, is not so difficult as the upkeep of improvements and machinery, very largely because less cash outlay is involved and the necessary means are very largely available to the farmers regardless of the price level. In such time as the present, however, the natural tendency is to use less care and effort because the rewards all along the line are, for the time being, less liberal. There is some general evidence that this tendency has already been reflected in reduced quality of livestock. Reports by farmers to the Bureau of Agricultural Economics on the quality of milk cows, as indicated by the rate of production, suggests that this class of livestock has suffered some decline in quality during the last three years. It would seem that such neglect as may have been responsible for deterioration of this sort reflects a mistaken policy. It costs but little cash, if any, to keep up the quality of livestock on the farm. Careful selection, skill in breeding, skill and diligence in feeding and care, are the main elements in the maintenance and improvement of livestock quality. On the other hand, the present period of low prices has reduced the cost at

which purebred breeding animals can be obtained and has made opportunity for replacing breeding stock at low prices—an opportunity which the thrifty farmer is not slow to grasp.

Farm Efficiency in a Period of Depression

It is often stated that economic depressions paralyze efficiency because low prices supply no adequate motive for improving or even for maintaining it. On the other hand, it is also asserted that periods of depression are responsible for many, if not most, of our periods of rapid technical advance. There is truth in both assertions. Farm efficiency must inevitably decline with such a serious decline in price as is now occurring. Much of such a decline is immediately due to lack of the funds without which the highest efficiency can not be maintained. On the other hand, there are periods and situations in which at least a moderate lowering of price does stimulate search for new means of increasing the efficiency in order to save at least some part of the margin of net gain.

Progress in farming methods may be classified into two types. The first is that stimulated by good prices that induce farmers to expand their output and reach out to "make a killing." An example of this is the rapid expansion in the use of combines and tractors in the Great Plains area of the Wheat Belt, when prices were so high as to make extensive wheat production unquestionably profitable. Such improvements are characterized by a substantial increase in the amount of agricultural-capital requirements per laborer. This increase carries with it an increase in the amount of land that can best be handled per worker, and hence a very substantial increase in the output of product per man. Within limits, a fall in price probably stimulates the use of this type of improvement, since large output means lower cost per unit of produce and hence a greater opportunity to make profit. However, when prices go extremely low this method is ineffective because it involves a high proportion of cash costs which can not be covered in the price of the product.

The second type of farm improvements making toward efficiency includes those which probably receive the greater stimulus in such a situation as the present. They are the improvements that make men more effective with a minimum increase in cash outlay. Such improvements come, for example, from the improvement of crop varieties through plant breeding, from better strains of livestock, better feeding methods, better care of product in an effort to get higher quality, and the like. One field man states that on his project nearly all of the farmers from whom he is obtaining data have increased their emphasis upon alfalfa. They are growing more of it; they are feeding it to all types of livestock, including poultry. One of the immediate motives for this was the avoidance of cash outlay for high-protein feeds, but its secondary effect is to incorporate in the cropping system an excellent hay crop that probably will become a permanent part of the rotation. To be sure, these measures do, incidentally, increase output by increasing the rate of yield. That is the essence of efficiency; more product from the same or from less investment of labor and the other means of production. But the important thing is that such measures avoid the increase of cash outlay and that is what is most desirable just now. Probably this latter type of farm improve-

163050°—33——25

ment will figure more largely in heightening farm efficiency in this country during the next 10 years than will the type that so greatly increases the scope of operations.

Financial Management

The farmers who have remained solvent and reasonably secure during the long and recently intensified agricultural depression may well claim substantial credit for financial management as well as for management of the farm itself. Yet those who have faced financial obligations beyond their debt-paying capacity can not, as a group, be blamed for their unfortunate position. No other economic group or class foresaw either the length of the agricultural depression or its final depth. It is no doubt true, however, that some of those persons who have failed might have remained solvent had they acted with the same degree of care and prudence shown by most of those in the first group of farmers.

Often, on adjoining farms of equal size and productive capacity, two farmers have started out equally well equipped and to all appearances similarly situated. No special individual and unavoidable disaster may have occurred to either of them. Yet to-day one owns his farm and other property largely or entirely free from debt, while the other has lost all that he had.

The different outcome in such cases is usually traceable to a difference in management of farm or financial operations, which in turn rests upon a difference in energy and discretion. No one can foretell with certainty what is ahead. But some farmers take all reasonable precautionary measures against contingencies and others take few, if any. Some have what may be called the wise investor's attitude. Others adopt more of the gambler's attitude toward risks that confront them.

The energetic and resourceful farmer avoids many common causes of loss. Before planting crops, he tests the seed whose germinating qualities are often doubtful. When occasion arises he treats his seed against threatened disease. He safeguards his livestock against threatened epidemics by vaccination or other available means. He carries insurance against fire, windstorm, and other hazards, in so far as satisfactory protection is available and his means permit. These precautions, or their omission, may alone account for the success of one farmer and the failure of another.

The avoidance of needless risks tends to be reflected in the net farm incomes. Many of the factors that make for differences in such incomes have been discussed under earlier headings. The following have special reference to financial management.

One farmer with the same amount of mortgage debt as his neighbor may pay a fifth to a half less in annual interest. It is not uncommon, particularly in some sections of the country, to find one farmer paying 5 or 5½ per cent on his loan when his neighbor is paying 8 per cent or even more. In addition, the one with the lower interest charge may have a long-term mortgage repayable on the amortization plan and therefore requiring no renewal, while the other has a loan that must be paid or renewed in three or five years from the date of the mortgage. Similarly, one farmer may pay 6 to 8 per cent for a short-term production loan from a local bank, while his neighbor pays charges of from 10 to 40 per cent on a corresponding amount of store or merchant

credit when the charges are calculated on an annual-interest basis. In some instances the higher rates are paid because the farmer has no choice of credit sources or terms. In many cases, however, the more burdensome terms are assumed merely because other sources of credit than those most readily at hand were not considered or sought.

Use of Net Farm Income

Although the individual farmer has little if any control over the price that his products bring him, and only partial control of his yield or output, he has essentially full control over any net income that he obtains. Many farmers who have remained solvent and relatively well situated even in the recent severe stages of the depression may ascribe their position in part at least to a farsighted use of earlier net income. With reference to such income they have again assumed the investor's attitude as distinguished from that of the speculator or gambler. They have used the income, in part at least, to add to their reserves against contingencies. The word "reserves" is here used in its broad or general significance, referring to available assets that can be used to meet emergencies, rather than in its narrower meaning of surplus set aside for a specific use, as reserve for depreciation, for taxes, or for some other purpose.

In either meaning, reserves are evidence of forethought, of planning against future needs or emergencies. As such, their creation in times of more normal income tends to distinguish the prudent and farsighted person from the more reckless or thoughtless. That farmers, as a class, build up reserves in some form, does not need to be argued. Even today, after a dozen years of agricultural depression greatly intensified in the last three years by a world-wide industrial depression, farmers in the United States operate on their own capital more largely than do most other economic groups.

In normal or good years most farmers spend for direct living expenses less than they make. Outstanding debts, if any, are paid off or reduced in amount. If the farmer is free from debt, his bank balance may be increased or a savings account created. A well-secured bond or mortgage investment may be added to the assets. Some life insurance with future loan and cash-surrender values may be taken out or the amount of such insurance may be increased. The inherent value and productive capacity of the farm may be enhanced by land or soil improvements or by the addition of needed buildings or fences. The livestock on the farm may be increased or improved in grade and quality. All these things add to the net assets and to the reserves against future contingencies.

Building up reserves naturally requires time as well as forethought, energy, and thrift. Therefore, the fact that many farmers had little reserve if any when the present depression set in, can by no means be charged against them in all cases. Some started farming about the time the depression began. Others started after the depression was on, hoping, of course, that better times for agriculture were immediately ahead. In view of the duration of the present agricultural depression and its more recent intensification, the wonder is not that large numbers of farmers have failed, but rather that farm failures have not been more general.

Even good policies or plans of action can, of course, be carried to excess. Some farmers, at one extreme, may be unduly cautious and may needlessly sacrifice present comforts and opportunities, but others, at the opposite extreme, take needless chances and make little or no allowance for contingencies.

Hasty overexpansion and ill-considered spending occur among farmers, as well as among other groups, and account for many a failure that was avoided by other farmers who at one time were no more favorably situated than those who failed. Farmers A and B, for example, who have recently acquired their farms, in a given year reap good harvests and obtain fair prices for their products. Farmer A believes in all reasonable safety measures and in reserves. Farmer B assumes the speculator's attitude of taking chances in the hope of quicker and larger returns. From his income for the year, farmer A, in addition to paying his taxes and the interest on his outstanding mortgage, pays off the bank loan secured by his livestock. If he has no such short-time loan, he may, if his contract or his creditor, permits, reduce his mortgage loan by a prepayment on the principal, or he may invest his year's savings in some of the ways that have been mentioned. In any case he increases his net assets in relation to his debts and in effect adds to his reserves.

Farmer B, with greater disregard for future contingencies, instead of reducing his debt spends all his net income for things that satisfy a desire for immediate enjoyment. Or else he promptly buys or rents as much more land as possible and perhaps goes farther into debt for added equipment. He may have increased the amount of property that is technically his, but his hold on what he owns is no stronger than it was before the good year and may be even weaker.

A year or two later both farmers experience crop failure and possibly at the same time an adverse change in the price situation. Farmer A, who if he has expanded his operations at all has done so with due caution, draws on his reserves if necessary and continues his operations. Farmer B is likely to lose all that he called his and have to start over again, empty-handed.

Hundreds of thousands of farmers who have held their own even during the trying years for agriculture that followed the World War, owe their present position in part to their attitude toward risk avoidance, reserves, and good financial management. Some, though by no means all, of those that have failed owe their failure to the disregard of these considerations. In all probability the future, like the past, will bring good years as well as bad years for farmers, even if such world disturbances as have recently occurred are not repeated. Bountiful crops will alternate with total or partial crop failures, and ups and downs in the price situation may also be expected. The next series of more favorable years should see a further increase in the large percentage of farmers who plan carefully and wisely, and a further decrease in the smaller group who take heedless and needless chances on the assumption that crop failures and price failures are all in the past and that reserves and other precautions against risks and contingencies are unnecessary.

C. L. Holmes *and* V. N. Valgren,
Bureau of Agricultural Economics.

READJUSTMENTS in Family Living Are as Drastic as Those Effected in Farming The economic situation in which the farmer now finds himself is forcing readjustments in the family living that are quite as drastic as those required in the operation of the farm itself. For several years the amount of income available for family expenses has been exceedingly limited in most farm households. With the further reduction in the cash returns from farming, the problem of meeting the needs of the family has become even more difficult. The success with which many families are handling this problem, however, testifies both to their ingenuity and courage and to the stability of rural life in times of economic crisis.

The first method which the farm family adopts in adjusting to a lowered income is producing more of its living at home. The land itself, the farm animals and equipment, and the labor resources of the family are the reserve forces of defense against a lowering of the level of living. This method of adjustment has been called upon in the present emergency to an extent reminiscent of pioneer days.

The Extension Service has, of course, long emphasized the value of a live-at-home program, both as an economical method of securing a well-balanced diet and as a means of releasing funds for the purchase of goods that can not be produced at home. And even in relatively prosperous years most farm families have been accustomed to raising much of the food they need, and many have provided themselves also with fuel, ice, and other supplies. They are now carrying this program still further, and thousands of farms are supplying almost all of the raw materials used by the families, while most of the work of preparing these materials for consumption is done within the homes.

But farm families can not provide for all of their needs by home production, even with this increased emphasis on self-sustaining farm life. Some items in the family budget can be obtained only from outside sources, and usually only by the expenditure of money. This is true, for example, of certain articles of clothing, the expenses of running the automobile, and some of the costs of health and recreation. In these cases farm families are making their adjustments by doing without the item, by postponing its purchase, or by purchasing a less-expensive substitute.

Other adjustments are taking the form of increased use of community facilities. The demands on free clinics and other free sources of medical care are mounting in rural districts. More families are now taking advantage of the borrowing privilege offered by public libraries, in order to reduce expenditures for magazines and books. And in many communities families are cooperating among themselves, by neighborhood lending of reading material and of equipment, and by exchanging the home-produced articles of one farm for those of another.

In making these adjustments farm women are planning ahead as never before for the wise use of their resources. They are choosing with the utmost care between the various demands upon their limited cash, and the numerous claims upon their time and energy. Through such balancing of values many farm families are meeting the present emergency with the least possible sacrifice of health and living standards.

Providing the Family Food Supply

The major adjustment that farm families are making while cash is so scarce is in producing more of their food supply at home. Although it has been the practice of most families to raise from one-half to three-fourths of the food they use, their cash outlay for this item has customarily been one of the largest, and often the largest, in the household budget. During the last decade $200 or more a year was usually spent for food, according to numerous studies of farm living. For example, a study of 2,886 farm families made by the department in 1922–1924 showed an expenditure for food of $218 a year, which was 23 per cent of the total amount of cash spent for the family. At present, few farm families can afford as much as $200 a year for food, and many are finding it necessary to live almost entirely on the foods they raise themselves.

Many households, in order to supply the necessities for the family table, are now drawing more heavily than usual on the products ordinarily raised for market. This is not surprising in view of the fact that prices received for products sold from the farm have declined much more than the retail prices of items that farm families purchase. For example, the farm price of wheat declined 55 per cent between January, 1929, and January, 1932, according to the Bureau of Agricultural Economics, whereas in the same period the retail prices of flour, bread, and wheat cereals declined 35, 21, and 11 per cent, respectively. Adjusting to the condition of the wheat market, many farm families are now supplying themselves with all of the cereal products they need by exchanging wheat for flour and by grinding wheat and corn for breakfast foods and for meal. And home baking of bread has been very widely revived.

The price of livestock offers another example. The farm price of beef cattle declined 52 per cent between 1929 and 1932, while the retail price of dressed beef declined only from 28 to 40 per cent, depending on the cut. This has resulted in the home slaughter of an increased number of animals for the family meat supply.

Home production for home use has been extended to many other articles of diet. Churning butter has come into vogue once more, and more cream is being used in cooking and on the table. The making of cured cheeses has been revived as a home practice. Eggs are now used freely when the market price is low, and in the spring many dozens are laid down in water glass for use in cooking during the winter months. In many farm households, home-produced honey, sorgo, and cane or maple sirup are taking the place of some of the sugar formerly purchased.

The necessity of depending more heavily on home-produced food has undoubtedly meant a poorly balanced diet in many instances. It is very difficult to provide all of the essentials of a good diet when the farm specializes in nonfood crops or a single commodity, to the exclusion of garden, poultry, and livestock enterprises. Farms having dairy cows fare better than those without, because milk and other dairy products make such important contributions to good nutrition of all members of the family. But recent census figures show that in 1929 a considerable proportion of farm families were not keeping even one cow for the family milk supply. In the country as a whole, only about 75 per cent of farm families were keeping milk cows, and the proportion in some States was as low as 60 per cent. Many of

these families who formerly bought their dairy products have now arranged with neighbors to obtain milk in exchange for some other commodity. Others are using either evaporated or dried milk to protect the health of the family.

Thousands of families have been able to maintain and even to raise their nutritional standards in the face of the emergency by carrying out a food-production program planned to fit their own needs. The Extension Service, with its many workers in the field, has been of great help to the farm household in formulating and carrying out the details of these plans. In the South about two-thirds of the counties, and in the Eastern States about three-fourths, support their own home demonstration agents. Although in the Middle West and far West only one-fourth to one-third of the counties have their own home demonstration agents, the State food and nutrition specialists in these regions are carrying out state-wide programs through trained

FIGURE 56.—A farm woman who is keeping records on the production and profits of her fall garden receives suggestions from the home demonstration agent

leaders of local groups, organized under the county agricultural agents. The adjustments which many families are successfully making are a tribute to the independent and courageous spirit of the individual families. They are a tribute also to the cumulative results of years of home demonstration and club work with projects centering around such interests as food selection, food preparation, food preservation, dairying, poultry raising, and gardening.

Home gardens have received more attention in the last two years than ever before. (Fig. 56.) Practically every State extension service has published home-garden plans, calculated to supply enough potatoes and at least two other vegetables to be used fresh during the growing season, and to be canned or stored for the winter according to a food-preservation budget. For example, from a bulletin of the Kansas extension service the farmer may learn that in order to serve his family a leafy vegetable three times a week for health protection,

he should have fresh greens in the garden between May 1 and October 15. The bulletin tells him also that the year's planting to supply summer needs and a surplus for canning must equal a row of 200 feet of greens, divided among different varieties according to the family's preference. All types of food are discussed in equal detail.

Numerous examples of the increased interest in gardening are given in a report made by the Extension Service. In certain counties of a Southern State the number of families who cultivated spring and summer gardens increased from 179,052 in 1930 to 259,354 in 1931, and the number raising fall and winter gardens increased from 27,131 in 1930 to 148,918 in 1931.

In another Southern State a woman enrolled in a home-garden contest reported that "Beginning with collards January 1 there has not been a day that we have not served fresh vegetables out of the

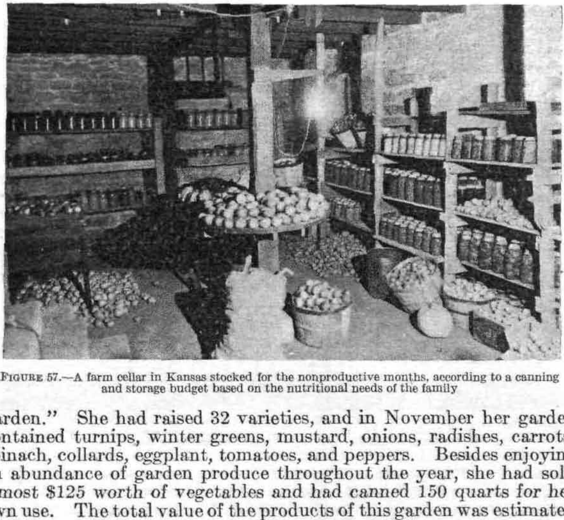


FIGURE 57.—A farm cellar in Kansas stocked for the nonproductive months, according to a canning and storage budget based on the nutritional needs of the family

garden." She had raised 32 varieties, and in November her garden contained turnips, winter greens, mustard, onions, radishes, carrots, spinach, collards, eggplant, tomatoes, and peppers. Besides enjoying an abundance of garden produce throughout the year, she had sold almost $125 worth of vegetables and had canned 150 quarts for her own use. The total value of the products of this garden was estimated at $276. An Illinois home maker reported that for a cash outlay of less than $10, a garden plot of less than an acre furnished $100 worth of vegetables for summer use, an additional $40 worth that were stored for winter, and $20 worth sold for cash. In Kansas, among 300 demonstration gardens, the average net returns per garden were estimated at about $65.

Canning and storage budgets have also been prepared by almost every State. These are based on local products and local climatic conditions. One example of such a vegetable and fruit canning budget is given in Table 19. The aim of the present food-preservation program is not merely to save the garden surplus but to can with family needs in mind. The prevailing practice now is to follow such a

carefully organized plan of producing, canning, and storing, that leafy and other green vegetables, red tomatoes and yellow carrots, with their supply of vitamins and minerals, and roasts, stews, chickens, and soup stock will appear on the table the year around. Such carefully laid plans safeguard the family's food supply through the winter. (Fig. 57.) On the other hand they prevent the canning of unneeded surpluses.

TABLE 19.—*Vegetable and fruit canning budget* [1]

Food	Weeks during which canned food is required	Times food will be served each week	Quantity to be canned	
			Per person	Per family of 5
	Number	*Number*		
Tomatoes	32	3	12 quarts	60 quarts.
Peas	24	1	6 pints	30 pints.
Snap beans	32	1	4 quarts	20 quarts.
Corn, beets, carrots	24	1	6 pints	30 pints.
Soup mixture	32	1	4 quarts	20 quarts.
Berries or figs	32	1	do	Do.
Peaches	32	1	do	Do.
Pears or apples	32	1	do	Do.

[1] Adapted from publication issued by the extension service of Alabama, a State with a long growing season. Winter gardens there provide greens most of the year.

In Alabama, according to extension service reports, 16,086 women and girls enrolled for food-preservation work and canned 1,903,637 quarts of fruits, vegetables, and meats during the 1931 season. Six thousand and sixty-five of them canned according to definite budgets suited to individual family needs. In Arkansas it was estimated that 261,244 families enrolled in home demonstration clubs canned 32,666,503 quarts of products from garden, field, and orchard in 1931. Of these families 82,134 had canned, according to budget, supplies that were ample for their winter needs. In Texas 11,271,198 glass and tin containers were sold for home canning in 1930; 30,360,627 in 1931, and it is estimated that about 50,000,000 were sold this year.

Last year farm women had been thinking beyond the needs of their immediate households when planning their work in food preservation. Canning soup mixtures and soup stock for school lunches, canning all sorts of products to be donated to such charitable institutions as children's homes or homes for the aged, or canning something to be donated to relief organizations for distribution to the unemployed or others in distress—all these have been individual or community projects in many localities. One State reported that one woman had supplied 1,000 containers for relief purposes in addition to canning 1,900 quarts for her own household, which unemployment had increased from 4 to 13 members.

Many plantation owners in the South have made it possible for their tenants to grow, can, and store sufficient food for the winter. On one plantation in Arkansas, for instance, the planter's wife organized the women of the 175 families on the place, both white and colored, into eight circles. Each circle was instructed in gardening and food preservation by leaders trained by the home demonstration agent. (Fig. 58.) As a result, every family on the place raised a garden and canned fruits and vegetables for the winter. Each tenant was also encouraged to keep a cow and at least 25 hens. It is partly

due to efforts such as these, no doubt, that pellagra, a disease caused by dietary deficiency, is decreasing in prevalence, even in the face of widespread economic distress. A home-food-production program makes it unnecessary to subsist on credit, with the accompanying danger of unbalanced diets.

These organized efforts to round out the food-production and food-preservation program so that an adequate diet will be available throughout the year, have brought about several outstanding developments in home-canning practices. Canning in tin has greatly increased, and the canning of beef, pork, stews, sausage, chicken, liver paste, and rabbit is much more extensively done at home than formerly. Through meat canning the men in many families have for the first time taken an active interest in the food-preservation work. Demonstrations in cutting, curing, and canning meat have been widely given. Last year one group of 36 Kansas women canned about

FIGURE 58.—One of the canning centers established in Arkansas in 1931. Like most of these centers, this was set up with the advice of the county home demonstration agent. In the winter these centers are often used for meat canning

4,500 pounds of beef, a quantity much greater than they could have afforded to purchase. In certain counties of Texas where 24,232 beeves and lambs were canned in 1930, 45,953 were canned in 1931; where 272,562 hogs were cured in 1930, about 338,000 were cured in 1931. Many families report that they are fattening beeves to supply meat for the family this year.

Another development that has come from this extensive preservation program is the community or neighborhood canning of foods. This practice has developed partly because of the recognized need for steam-pressure canners in the canning of all meats, fish, and nonacid vegetables. In some States, counties have equipped canning trucks and sent them out on schedule with the home demonstration agent or a local leader, so that as many families as possible could benefit by the use of the equipment and by the leader's instruction in canning

methods. The result of this new emphasis on food preservation has made the total number of containers of home-canned products break all records, even those established during the food-conservation program of the World War. Last year farm families also improved their storage facilities to provide proper conditions in cellars or out-of-door pits or caves for storing a wide variety of winter vegetables and fruits.

The prominence of garden planning and food conservation in the teaching program of the Extension Service has developed in connection with the emphasis on food selection. From planning balanced diets for a day and a week, attention was next directed to planning ahead for the nonproducing season. Following as a logical development, attention is now focusing on planning a balanced food supply for the whole year.

Several States have drawn up suggestive food-supply budgets for the guidance of farm families. These naturally differ somewhat in the level of dietary adequacy provided, and in the level of cost in effort and money. Any plan must, of course, be modified by the individual family to suit its own needs. Table 20 presents one example of a yearly food-supply list for a family of five. It is made up of suitable quantities of the different kinds of food needed for health and allows enough variety so that interesting and palatable meals can be prepared from it. If a family had purchased all of the items in this list at 1931–32 city retail prices, the cost would have been approximately $650. A less expensive food plan, also adequate from the standpoint of nutrition, could be made by using a larger proportion of whole-grain cereals and less of some kinds of vegetables and of the lean meats and eggs, while a more expensive plan would allow greater variety in some of the food groups.

TABLE 20.—*A suggested food-supply budget providing an adequate diet for a 5-member farm family,*[1] *showing approximate quantities of food needed for a week and for a year*

Food	Unit	Quantities needed		Food	Unit	Quantities needed	
		Per week	Per year			Per week	Per year
Milk	Gallon	8	410	Butter, lard, salt pork, bacon	Pound	4½	234
Potatoes	Bushel	¼	14¼	Bread	do	15	780
Dried beans, peas, nuts	Pound	1⅓	69	Additional flour, cereals	do	4	208
Tomatoes, citrus fruit	do	9	468	Sugar	do	4	208
Green-colored vegetables	do	8	416	Molasses, jelly, etc	do	2	104
Other vegetables	do	14	728	Tea, coffee, cocoa, baking powder, soda, salt, and other accessories		(2)	(2)
Fruits (weight, fresh)	do	12	624				
Lean meat, fish, poultry	do	10	520				
Eggs	Dozen	2½	130				

[1] 2 active adults; 3 children, aged 3, 5, and 12 years.
[2] As desired.

Many farm families, through their home-production programs, have enjoyed a diet more generous than that represented by Table 20, at a money expenditure of less than half of $650. Indeed, as shown in Table 21, if the program for home food production and preservation is pushed to the extreme, the expenditures for a fully adequate food supply with interesting variety may be reduced to a very small sum. The adjustments that farm families are making the country over are evidence of the feasibility of such reduced cash expenditures.

TABLE 21.—*A suggested division between foods raised and foods bought, in an adequate yearly food supply for a 5-member farm family* [1]

Food	Money value of food at retail prices		
	Raised	Bought	Total
Milk, cheese	$185–195	$10– 0	$195
Vegetables, fruits	100–160	60– 0	160
Lean meat, poultry, fish, and eggs	120–130	10– 0	130
Butter, lard, salt pork, bacon	45– 52	7– 0	52
Bread, flour, cereals	0– 53	53– 0	53
Sugar, molasses, sirup, jelly	5– 35	30– 0	35
Accessories	0– 0	25–25	25
Total	455–625	195–25	650

[1] 2 active adults; 3 children, aged 3, 5, and 12 years.

Cutting the Costs of Clothing

The second large adjustment that farm families are making in the present emergency is in expenditures for clothing. Next to food, this item usually makes the heaviest demands on the budget of the farm household. For example, the 2,886 farm families studied in 1922–1924 spent on the average $235 for clothing, which was 26 per cent of the total cash spent for family living. Clothing needs are, however, more flexible than food needs for most families. When retrenchment is necessary, the first and very obvious adjustment that many families make is to get along with the wardrobe on hand, postponing the purchase of new clothing as long as possible. The second adjustment, when replacement can no longer be postponed, is substituting less expensive garments for those that have worn out. And meanwhile, remodeling and frequent cleaning and mending assume new importance as means of prolonging the life of the wardrobe. Just these and numerous other clothing economies are now being practiced in farm homes throughout the country, although figures that show the amount of saving effected are not available.

Many housewives are feeling the need for information and help in getting the utmost use out of the clothes they have. To meet this need the extension services in many States are holding clothing clinics, which are very popular. At these clinics demonstrations of the best methods of caring for clothing, including dry cleaning, removing spots and stains, mending and pressing, are given. Instruction is also given in remodeling garments and hats, and in bleaching and dyeing. To a greater extent than usual, farm women are making over their own, their husband's, and their children's clothes for the younger members of the family. And in many households, the resoling and repairing of shoes has been revived as an emergency practice.

But in spite of the best care and repair, even the most durable clothing will in time wear out and must be replaced. And home production can not solve the clothing problem to the extent that it solves the food problem. The arts of spinning and weaving have vanished from the accomplishments in almost all farm households, and few farm women have the skill to make all of the family's clothes at home. Many types of garments must be bought ready-made, and with these the chief opportunities for thrift lie in exercising good judgment in purchasing, so as to get the fullest value out of every dollar spent. This is true,

of course, of shoes and other footwear, which ordinarily take from one-fourth to one-third of the total clothing outlay in the farm household. It is usually true also of men's coats, suits, and other outer garments, which normally make up about one-half of their clothing costs.

For the women and girls of the family, however, and for the small sons as well, the outlay for outer garments can be considerably reduced by home sewing. Farm women are now turning to this means of economizing to a much greater extent than usual. In many families all of the dresses, waists, skirts, and aprons worn by the housewife and her daughters are made at home, and some women are even venturing to make coats and other tailored garments for themselves and the children. And for all members of the family undergarments are again being made at home. Although the outlay for underwear is often less than one-tenth of the total cost of clothing, the savings during the year for the whole family may amount to an appreciable figure.

Just as judgment is essential in selecting purchased garments, it is important for the woman who tries to save by home sewing to turn to the type of garments that will be most profitable for her to make. In general, the more standardized the garment, the cheaper it can be bought ready-made, and the smaller the margin of profit in making it at home. The Bureau of Home Economics recently made a study of the relative cost of ready-made garments and the cost of materials that went into similar home-made garments. Five hundred and forty-eight farm housewives in five States cooperated in the study. No attempt was made to compare the quality of the materials, or the cut or fit of the garments. The results showed that the cost of materials for cotton and wool skirts, nightgowns, and pajamas averaged from 75 to 90 per cent of the prices paid for ready-made garments. The materials used for aprons, cotton, wool, and silk dresses, blouses, outer bloomers and knickers, brassieres, underwaists, chemises, combinations, and kimonos averaged from 45 to 75 per cent of the cost of the finished garments.

But the possible savings through home sewing depend not only on the relative costs of the materials and the finished garment; they depend also on the value of the home maker's time, measured in terms of what other profitable use she might be making of it. Considering only the direct cash saving, the value of the farm housewife's time may run as high as $2 an hour on jobs requiring considerable skill, particularly when it is possible to utilize materials already on hand. It may, however, be worth only 10 cents an hour in making the simpler and more standardized kinds of garments. But in the prevalent scarcity of cash, many farm home makers are finding even such small savings worth while. In spite of the comparatively low cost of much ready-made clothing to-day, it is estimated that the value of home sewing in many farm households amounts to as much as $75 a year.

Reducing Family Expenditures for Other Items

For most farm families a large share of the reduction in living expenses must come from many small economies in the various items in the family budget other than food and clothing. This group of expenses includes the cost of fuel, light, and other household operation, furnishings and equipment, automobile and other travel, education, recreation, health, and such personal expenses as tobacco, candy, and

toilet supplies. The total cost of these items in many households is as a rule just about equal to the combined cost of food and clothing. For instance, the 2,886 farm families studied by the department spent, on the average, $461 a year for these items, more than half of the total yearly expenditure of $914. Though it is usually not possible to make a large saving on any one of these items, there are many opportunities for small savings and for substituting home-produced goods and services for those usually purchased.

Some farm families are making a considerable share of these savings in the household-operation group alone. Even in more normal times many households depend for their fuel very largely on farm-produced wood and cobs, and very little on purchased fuel. Now they are seizing the opportunity for further saving in this direction. Reports from the Middle West indicate that some families without wood lots are burning grain instead of buying fuel. Fuel economies include not only producing on the farm as much of the supply as possible, but also careful use and proper adjustment of the stove in cooking. By proper planning, housewives frequently save fuel, as well as time and energy by cooking the food for more than one meal at one time.

Many farm women are now making laundry and toilet soap from by-products of home slaughtering, while other families report that they are making furniture polish and hand lotion. Although the amount of savings on any one of these products is not great, the effort involved is worth while if the housewife's time is not too crowded. This is especially true of soap, when there is surplus fat on hand and the only outlay involved is for lye, coloring, and perfume. In two recent studies the cost of making laundry and toilet soap at home was found to be less than 2 cents a pound.

Another direction in which many farm families are economizing is in expenditures for telephones. For the country as a whole the number of telephones increased by 59 per cent in the 10 years preceding the 1930 census. During the same period the number of farm telephones declined about 14 per cent, although the decline in the number of farm homes was less than 3 per cent. A considerable further reduction in the number of farm telephones has taken place in the last two years as a part of the farm-home economy program.

Cutting down on the unnecessary use of the family automobile is an obvious way of reducing the cash outlay for gasoline and lubricating oil. Many of the families forced to economize in these expenditures have effected savings through cooperative organizations selling gasoline and oil to their members. Three cooperative purchasing organizations dealing only in gasoline, oil, and grease reported business for 1930–31 ranging from $600,000 to $1,600,000. Reports to the Federal Farm Board in the last year indicate that there has been a decided increase in the number of cooperative marketing associations purchasing gasoline and lubricating oil for their members, as well as in the number of consumer cooperatives handling these items.

Not since pioneer days has so large a proportion of farm housewives been making quilts, piecing bed covers, and tufting spreads. In some parts of the country women are stuffing pillows and comforters with feathers from the farm flock and are making mattresses. Making rag rugs at home is an increasingly popular thrift practice. This not only reduces expenditures for floor coverings but gives a use for the cloth in garments worn past repair or remodeling.

Upkeep of the farm house without unnecessary cash outlay is involving other widespread adjustments in furnishings and repairs. For instance, women are finishing furniture at home wherever possible in preference to buying new pieces. In some sections the farm family is finding it feasible to utilize home-grown timber for certain types of inside repairs and improvements, instead of buying lumber. This is an essential saving because, though the prices of building materials are lower now than since 1917, reduced money income in many farm homes has restricted the purchase of such items to bare requirements for absolutely necessary repair jobs.

The drastic lowering of cash incomes throughout the country has cut out numerous smaller expenditures such as those for commercialized entertainment, for books and periodicals, for music and travel. In many instances this has served to consolidate the family group and to strengthen neighborhood friendships through cooperative forms of entertainment and through the exchange of reading material. Unfortunately, retrenchment in expenditures has required many families to reduce temporarily their outlay for education. However, the enrollment figures of the land-grant colleges and universities and post-graduate high-school courses indicate that many families are still able to make the sacrifices which higher education for their children always involves.

Planning Ahead for the Use of Money and Time

Skillful budgeting is obviously needed if the farm family is to get the most out of its present limited income. Realizing this fact, farm women everywhere are giving increased attention to budgeting family expenditures and keeping accounts. The extension service reports household accounting and budgeting projects in 36 States in 1931. The reports show that more than 2,000 women in Ohio and Illinois are keeping household accounts at present. Women are taking unusual interest just now in information on how to buy the various articles for which money must be spent. This interest has made courses in household purchasing an important feature of the extension teaching program in 24 States.

There has always been less hand-to-mouth buying in rural areas than in the cities, because farm homes generally have better storage facilities and are not as close to the retail store. In the last few years, however, farm home makers have been taking greater advantage of the savings made possible by quantity buying. They have saved money also by making fewer purchases on the installment plan. Such purchases have declined much more than the total volume of sales since 1929.

The increase in home production caused by the live-at-home program is requiring much extra work on the part of most farm home makers. It is therefore even more important than usual for them to plan their time expenditures effectively, and to safeguard their energy and strength during these difficult years.

Even before the present emergency, the demands upon the farm woman's time were heavy enough. Studies of over 1,000 farm households, made by the Bureau of Home Economics and several State experiment stations, show an average working week for the home maker of 62 hours. The major share of this time was spent in the routine housekeeping tasks that must be performed in every home. Preparing and clearing away meals alone required almost 23 hours a week, while the

cleaning and other care of the house and the laundering and mending totaled 16 hours more.

When the care of small children is added to this schedule, the farm woman is hard pressed to find time for the gardening, canning, sewing, and other jobs that are part of the home-production program. Her present heavy schedule is making it especially necessary for her to follow an organized plan of work. Furthermore, in order to realize the greatest returns for her time and effort, she is seeing the value of choosing carefully from the many tasks at hand. Some she eliminates altogether, and some she is taking on only as temporary and emergency duties. And because it is out of the question for one person to carry so great a burden, farm housewives are calling on other members of the household to help with these new duties and to take a greater share of the responsibility for the usual home-making jobs. It is only by the cooperation of members of the family and by concentrating on the most important tasks that the year's program can be carried out successfully.

Contributing to the Family's Cash Income

The extent to which the farm woman contributes directly to the cash income of the family, aside from the large value of her services in the home, is not generally recognized. No fewer than 8.8 per cent of the farm home makers of the country were reported by the 1930 census as gainfully employed. Many of these 549,947 women, of course, were running their own farms or were working regularly on the home farm most of the time. But a large proportion were employed away from the farm as teachers, clerks, telephone operators, postmistresses, industrial workers, and dressmakers and in numerous other capacities.

In addition to these farm women reported by the census as gainfully employed, there is a large number of rural home makers who earn money only occasionally or through regular part-time work. These women are adding materially to the cash income of their families through a wide range of activities. Some are weaving, making baskets, tufting bed spreads, making rugs and feather fans, and doing batik work. A few are giving shampoos and facial massages, reviewing books, writing local news items, teaching music, and tutoring the neighbor's children. A much greater proportion are making jams and jellies, pastries, cakes, and other cooked goods for sale, and are raising vegetables, chickens, and other farm products for the market.

In disposing of their home-produced goods some farm women are continuing to use the individual roadside market, but many have joined women's marketing associations organized by the home demonstration agents. These marketing associations are the most striking outcome of the rural home makers' increased need to supplement the family income. The home demonstration leader in one of the Southern States writes:

> The association sponsors only women's markets, a place for farm women to sell their surplus to the housewives of the town. Truckers and men in general are not allowed to sell, though husbands and sons may, and do, assist in other ways. The products handled consist of butter, cream, buttermilk, eggs, live and dressed poultry, lamb, pork, nuts, vegetables, fruits, cakes, pies, canned goods, home-ground meal, and lye hominy. Sales range in a single market in this State from $750 to $1,000 a month. Numbers of our women have been able to provide clothing and food for their own and other families on their farms because of the profits from this market.

Another home demonstration leader in the South reports three curb markets functioning in her State, with total sales of $15,800 during the year. Figures showing the increased number of sellers at a women's market in one county of another Southern State are significant. In 1929 the total number was 393; in 1930 it was 511, and in 1931 it was 630. The value of the sales in this county is even more significant. In 1928 it was $79,970; in 1929 it was $104,805; in 1930 it was $137,450, and in 1931 it was $124,719.

Home demonstration agents are organizing rural women's marketing associations wherever there is a demand for them. Previous to 1931, 87 agents had organized 330 such associations and in 1931, 53 agents organized 149 more. The total membership of 34,687 farm women in this new marketing development is additional evidence of the women's eagerness to improve the economic situation in their own homes.

HILDEGARDE KNEELAND *and* HAZEL K. STIEBELING,
Bureau of Home Economics.

163050°—33——26

AGRICULTURAL STATISTICS

Prepared under the direction of the statistical committee: Joseph A. Becker, chairman, Lewis B. Flohr, secretary, S. W. Mendum E. J. Working, B. C. Boree, and V. N. Valgren

In the interests of economy, many tables formerly regularly included in this section of the Yearbook are omitted this year and the number of years has been reduced for many series. Recent data for the omitted tables are for the most part available in current publications and can be supplied upon direct request. For data for earlier years not covered in this Yearbook, the user is referred to past issues.

The statistical section of this Yearbook brings together what seem from experience to be the most important agricultural statistics for the United States, and for the world so far as the agriculture of this country is concerned. Historical and geographical series have been given.

For greater detail on individual commodities than can be shown in the Yearbook, the Statistical Bulletin series of the department may be consulted.

For cnrrent statistics to supplement Yearbook statistics, tho following sources should be used: (1) Crops and Markets—a monthly publication of the department carrying the latest current statistics on agriculture in the United States; (2) Foreign Crops and Markets—issued weekly by the Bureau of Agricultural Economics and devoted to current world statistics of crops, livestock, and markets; (3) foreign commodity reports—published by the Bureau of Agricultural Economics and showing the latest world information on single commodities and released as important information is received; (4) The Agricultural Situation—issued monthly; (5) market news reports of the Bureau of Agricultural Economics—issued daily, weekly, monthly, quarterly, or at irregular intervals, at Washington and at the principal markets.

The crop and livestock reporting service estimates acreage, condition of crop, yield per acre, production, and farm prices of crops, and numbers, production, farm prices, and values of livestock and livestock products. The organization of this work outside of the Crop Reporting Board and the office force in Washington consists of 41 State field offices, each with an agricultnral statistician in charge. There is one field office for the New England States, one for Maryland and Delaware, and one for Utah and Nevada.

Acreages for the year 1909 are as reported by the Bureau of the Census; acreages in 1919, 1924, and 1929 are based upon the census supplemented by State enumerations. In the intercensal years, from 1910 to 1915, estimated acreages were obtained by applying estimated percentages of decrease or increase to the published acreage in the preceding year. The estimates from 1916 to 1918, 1920 to 1923, 1925 to 1928, and 1930 to 1932 are based upon acreage changes from year to year as shown by a sample of over 2 per cent of the crop acreages in each year, supplemented by State enumerations. Yields per acre are estimates based upon reports of one or more farmers in each agricultural township on the average yield per acre in their localities. For 1929 to 1932, yields for all crops except cotton have been adjusted to be comparable with yields derived from the census of 1919, 1924, and 1929. For all crops except cotton and a few minor crops, yields from 1919 to 1928 have been adjusted to be comparable with the census yields of 1919, 1924, and 1929. For these same crops, revisions of acreage have been made for the period 1919 to 1928 essentially to the acreages reported by the censuses of 1919 and 1929. Production is acreage times yield per acre.

Estimates of farm stocks, sales, quality, crop condition, and miscellaneous information concerning crops are based either upon sample data or upon estimates of crop reporters for their localities.

The term "commercial" is used in connection with certain crop estimates to distinguish some part of the total production of a crop. Except for indicating that the entire production is not represented in the estimate, "commercial" does not have the same meaning in each instance where used. The commercial apple-crop estimate, for example, represents that portion of the total apple crop which is sold or available for sale for consumption as fresh fruit. That portion of the crop which is used for cider, vinegar, canning, evaporating, or other manufacture is not included in the commercial crop as defined in this case. The commercial orange and grapefruit crops in Florida represent the portion shipped or to be shipped as differentiated from the portion canned, made into juice, sold or consumed locally, wasted, etc. Estimates of commercial truck-crop production are concerned only with those areas growing the crops primarily to supply the large consuming markets more or less distant from the producing center. Production in home and market gardens, intended principally for local sale, is excluded. Similarly with truck crops grown for commercial canning or manufacture the estimates include only amounts grown for use by canning or packing establishments and exclude amounts canned in the home. The truck and canning crop estimates are designed to include the total quantity produced on the commercial acreage in the areas concerned, whether or not the entire crop finds a market or a use.

Monthly estimated prices received by producers on the specified dates are based upon reports from special price reporters, who are mostly country dealers, on the average price paid to farmers for the commodity, and do not relate to any specified grade.

Farm values of crops as shown are mostly computed by applying the December 1 farm price to the total production. These prices are reported by the crop reporters, who are mostly farmers. The average price received for the portion of the crop sold may be greater or less than this price, depending upon the prices previous and subsequent to December 1, and the amount of the crop sold at the different prices. For the years 1929–1932, weighted average prices for the crop-marketing season and farm values based upon these weighted prices, have displaced the December 1 prices and values for many crops. For commercial truck and canning crops, and for certain fruit crops, the prices shown are the estimated seasonal averages of the prices received by growers at the shipping point, the cost of the container included if a customary requirement of delivery.

Numbers of livestock on farms on January 1, 1920, and 1925, are based upon the census enumeration as of that date, supplemented by enumerations by State agencies, such as assessors and brand-inspection boards, and by records of shipments during 1920 and 1925. Numbers on January 1, 1930, give weight in so far as feasible to the numbers reported by the census of 1930 which was as of April 1, with allowance for indicated changes between January 1 and April 1. In the intercensal years, from 1911 to 1916, the numbers of livestock were obtained by methods identical with those used for crop acreages. Estimates from 1917 to 1919, from 1921 to 1924, from 1926 to 1930, and from 1931 to 1933 are based upon a sample of over 2 per cent, supplemented by trends derived from assessors' enumerations, reports of brand inspection boards, market movements, and stockyard receipts. The census bases are not always comparable from one decade to another, because of changes of dates and classifications.

The average value per head on January 1 is estimated from reports of correspondents relating to livestock in their vicinity. These tend to reflect inventory values as distinguished from the monthly prices which relate to sales. The farm value on January 1 is computed by applying the average value per head to the number on farms.

The Federal market news service supplies much of the information on market prices and movements. The leased-wire system in use by the service extends from the Atlantic to the Pacific and reaches most of the important markets of the country. At each of the branch offices commodity specialists gather information regarding the supply, the demand, and prices for the products on which they report. They observe the sales actually made on the markets and are constantly in touch with the traders, who in many instances give them access to their office records in order that they may have specific information on which to base their reports. Car-lot shipments and market receipts of crops and livestock products are reported by officials and agents of railroads, express companies, and boat lines, or compiled from trade publications. Shipments to market by autotruck have continued to increase and at some of these markets receipts by truck are reported by dealers and distributors. Data on receipts, slaughter, and shipments of live-stock are obtained from monthly reports submitted by the public stock-

yards. Data on cold-storage stocks are obtained directly from all important cold-storage warehouses, and data on commercial stocks of grain are reported by boards of trade, etc. Leaf-tobacco stocks are reported directly by dealers and manufacturers.

Where a weighting factor is available, market prices as shown are weighted averages; but in many cases a weighting factor is not available, and the prices shown are usually the means of ranges of quotations without reference to quantity. The weighted market prices of grain are based on the number of carload sales reported. The weighted average price of hogs at Chicago is based on total sales of butcher and packer hogs to slaughterers.

Prices derived from different sources may not be strictly comparable, although for most general purposes they are satisfactory. The data as to commercial stocks and movements of various commodities are as nearly complete as practicable and feasible, and are considered fairly representative.

The statistics of grain grading are based on work done by licensed grain inspectors located throughout the United States.

Statistics of acreage and production in foreign countries are compiled as far as possible from official sources and are therefore subject to whatever errors may result from shortcomings in the reporting and statistical services of the various countries. Inaccuracies also result from differences in nomenclature and classification in foreign countries. Except where otherwise stated, pre-war data refer to pre-war boundaries. Yields per acre are calculated from acreage and production, both rounded to thousand units, and are therefore subject to a greater possibility of error when calculated for countries with small acreage.

The tables of international trade cover substantially the international trade of the world. The total imports and the total exports in any one year can not be expected to balance, although disagreements tend to be compensated over a series of years. Among the sources of disagreement are: The different periods covered by the "year" of various countries; imports received in the year subsequent to the year of export; lack of uniformity in classification of goods as among countries; different trade practices and varying degrees of failure in recording countries of origin and ultimate destinations; different practices in recording reexported goods; and different methods of treating free ports. The exports given are domestic exports and the imports given are imports for consumption whenever it is possible to distinguish such imports from general imports; that is, "special" or net instead of general. General imports are all imports reported. In foreign countries "special" trade is imports for consumption; or net imports, or imports less reexports. In the United States imports for consumption are those entered for actual consumption and include withdrawals from bonded warehouse for consumption. Special or net figures are used in the international trade tables for the following countries: Belgium, Denmark, Egypt, Irish Free State, China, Dutch East Indies, France, and United Kingdom. In the United States trade tables and wherever United States figures are given, they are domestic exports and general imports unless otherwise specified. While there are some inevitable omissions, there may be some duplication because of reshipments which do not appear as such in the official reports. In the trade tables, figures for the United States include Alaska, Puerto Rico, and Hawaii, but not the Philippine Islands.

As an aid to the comprehension and use of these statistics, the following table of weights, measures, and conversion factors will be useful:

Weights, measures, and conversion factors used in the Department of Agriculture

Commodity	Unit [1]	Weight in pounds	Commodity	Unit [1]	Weight in pounds
Alfalfa seed	Bushel	60	Orchard grass	Bushel	14
Apricots	do	48	Peanut oil	Gallon	7.5
Barley	do	48	Potatoes	Bushel	60
Beans, dry	do	60	Rapeseed	do	50
Buckwheat	do	48	Rice, rough	do	45
Clover seed	do	60	Rice, cleaned	do	60
Corn, shelled	do	56	Rye	do	56
Corn, ear, husked	do	70	Rye flour	Barrel	196
Cotton, ginned	Bale	[2] 478; [3] 500	Soybean oil	Gallon	7.5
			Spelt	Bushel	40
Cottonseed oil	Gallon	7.5	Timothy seed	do	45
Cranberries	Barrel	100	Tomatoes	do	56
Flaxseed	Bushel	56	Wheat	do	60
Grain sorghum	do	56	Wheat flour	Barrel	196
Grapefruit	Box	[3] 70	Almonds, apricots, asparagus, snap beans, beet sugar, broomcorn, cabbage, cane sugar, cottonseed, figs, grapes, hay, plums, prunes, raisins, sugar, sugar beets, sugarcane, walnuts	Short ton	2,000
Hempseed	Bushel	44			
Lemons	Box	[3] 74			
Milk	Gallon	8.6			
Oats	Bushel	32			
Oranges (California)	Box	[3] 70			
Oranges (Florida)	do	[3] 80			

Commodity	Equivalents
Almonds	1 pound shelled is equivalent to about 3⅓ pounds unshelled.
Apples	1 pound dried is equivalent to about 5 pounds of fresh.
Barley flour	1 barrel (196 pounds) is equivalent to about 9 bushels of barley.
Buckwheat flour	1 barrel (196 pounds) is equivalent to about 7 bushels of buckwheat.
Filberts	1 pound shelled is equivalent to about 2.22 pounds unshelled.
Malt	1.1 bushels (34 pounds) is equivalent to about 1 bushel of barley.
Oatmeal	1 barrel (196 pounds) is equivalent to about 10⅝ bushels of oats.
Do	18 pounds is equivalent to about 1 bushel of oats.
Peanuts	1 pound shelled is equivalent to about 1⅓ pounds unshelled.
Peaches (California)	1 pound dried is equivalent to about 5½ pounds fresh.
Prunes	1 pound dried is equivalent to about 2½ pounds fresh.
Rye flour	1 barrel (196 pounds) is equivalent to about 6 bushels of rye.
Raisins	1 pound is equivalent to about 4 pounds of grapes.
Wheat flour	1 barrel (196 pounds) is equivalent to about 4.7 bushels of uncleaned wheat.[4]
Walnuts (English)	1 pound shelled is equivalent to about 2.38 pounds unshelled.

[1] Standard bushel used in the United States contains 2,150.42 cubic inches; the gallon, 231 cubic inches.
[2] Net.
[3] Gross.
[4] Due to changes in milling processes, equivalents used have varied as follows: 1790–1879, 5; 1880–1908, 4.75; 1909–1917, 4.7; 1918–19, 4.5; 1920, 4.6; 1921–1931, 4.7.

STATISTICS OF GRAINS

TABLE 1.—*Wheat, all: Acreage, production, value, exports, etc., United States, 1890–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Spring wheat, price per bushel at Chicago, year beginning July [1]	No. 2 red winter wheat, price per bushel at Chicago, year beginning July [2]	Foreign trade, including flour, year beginning July [3]			
								Domestic exports [4]	Imports [5]	Net exports [6]	
										Total	Percentage of production
	1,000 acres	*Bush.*	*1,000 bushels*	*Cts.*	*1,000 dollars*	*Cts.*	*Cts.*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1890	34,048	11.1	378,097	83.3	315,112	97	89	109,017	586	109,054	28.8
1891	37,826	11.5	584,504	83.4	487,463	89	96	229,465	2,463	228,841	30.2
1892	39,552	13.3	527,987	62.2	328,331	73	78	196,068	968	195,672	37.1
1893	37,934	11.3	427,553	53.5	228,599	60	68	168,498	1,183	167,531	39.2
1894	39,425	13.1	516,485	48.9	252,709	57	57	148,630	1,439	147,740	28.6
1895	40,848	13.9	569,456	50.3	286,539	61	62	130,099	2,117	130,345	22.9
1896	43,916	12.4	544,193	71.7	390,346	70	67	148,767	1,545	148,725	27.3
1897	46,046	13.3	610,254	80.9	493,683	91	86	221,143	2,060	220,965	36.2
1898	51,007	15.1	772,163	58.2	449,022	71	90	227,240	1,875	227,300	29.4
1899	*52,589*	*12.5*	*658,534*								
1899	52,589	12.1	636,051	58.6	372,982	70	[7] 72	190,772	320	190,749	30.0
1900	51,387	11.7	602,708	62.0	373,578	75	76	220,653	603	220,723	36.6
1901	52,473	15.0	788,638	62.6	493,766	74	72	239,212	121	239,137	30.3
1902	49,649	14.6	724,808	63.0	456,851	77	75	207,835	1,080	208,016	28.7
1903	51,632	12.9	663,923	69.5	461,439	90	83	124,977	229	124,920	18.8
1904	47,825	12.5	596,911	92.4	551,788	114	[8] 100	46,319	3,296	43,612	7.3
1905	49,389	14.7	726,819	74.6	542,543	89	[7] 88	101,089	273	100,849	13.9
1906	47,800	15.8	756,775	66.2	501,316	84	77	150,597	602	150,594	19.9
1907	45,116	14.1	637,981	86.5	552,074	107	90	166,525	530	166,304	26.1
1908	45,970	14.0	644,656	92.2	594,128	116	96	116,373	475	115,901	18.0
1909	*44,263*	*15.4*	*683,379*								
1909	44,262	15.8	700,434	98.4	689,108	114	110	89,173	845	88,465	12.6
1910	45,681	13.9	635,121	88.3	561,051	107	102	71,338	1,175	70,164	11.0
1911	49,543	12.5	621,338	87.4	543,063	110	90	81,891	3,445	78,447	12.6
1912	45,814	15.9	730,267	76.0	555,280	94	103	145,159	1,304	143,938	19.7
1913	50,184	15.2	763,380	79.9	610,122	93	88	147,955	2,402	146,306	19.2
1914	53,541	16.6	891,017	98.6	878,680	132	108	335,702	728	335,162	37.6
1915	60,469	17.0	1,025,801	91.9	942,303	120	113	246,221	7,254	239,591	23.4
1916	52,316	12.2	636,318	160.3	1,019,968	196	168	205,962	24,960	181,067	28.5
1917	45,089	14.1	636,655	200.8	1,278,112	227	225	132,579	31,215	102,775	16.1
1918	59,181	15.6	921,438	204.2	1,881,826	234	222	287,402	11,289	276,615	30.0
1919	*73,099*	*12.9*	*945,403*								
1919	73,700	12.9	952,097	213.1	2,028,518	276	224	222,030	5,511	216,671	22.4
1920	62,358	13.5	843,309	143.3	1,208,339	198	223	369,313	57,682	312,625	37.5

Bureau of Agricultural Economics. Production figures are estimates of the Crop-Reporting Board, revised 1919 to 1928. See introductory test; italic figures are census returns.

[1] 1890–1896, Bartel's Red Book, quoted as No. 2 spring; January, 1897–June, 1904, Chicago Daily Trade Bulletin, average of daily ranges; quotations used: January–October, 1897, No. 3 spring; November, 1897–June, 1898, No. 3 spring, hard varieties; July, 1898–June, 1904, No. 1 spring; from February, 1897, "free on board" was used when available; July, 1904–December, 1918, Bartel's Red Book, average of daily ranges, quoted as No. 1 northern. Subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

[2] Prices, 1890–1898, are from the Price Current Grain Reporter 1924 Yearbook, p. 4, and are average cash prices for calendar years; subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

[3] Compiled from Commerce and Navigation of the United States, 1890–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932. Wheat flour converted to terms of grain on the following basis: 1890–1908, 4.75; 1909–1917, 4.7; 1918–19, 4.5; 1920, 4.6; 1921–1932, 4.7.

[4] Includes flour milled from imported wheat.

[5] Includes wheat imported for milling in bond and export.

[6] Total exports (domestic plus foreign) minus total imports.

[7] Weighted average for 11 months.

[8] Weighted average for 10 months.

TABLE 1.—*Wheat, all: Acreage, production, value, exports, etc., United States, 1890–1932*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Spring wheat, price per bushel at Chicago, year beginning July	No. 2 red winter wheat, price per bushel at Chicago, year beginning July	Foreign trade, including flour, year beginning July: Domestic exports	Foreign trade: Imports	Net exports: Total	Net exports: Percentage of production
	1,000 acres	*Bush.*	*1,000 bushels*	*Cts.*	*1,000 dollars*	*Cts.*	*Cts.*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1921	64, 566	12. 7	818, 964	90. 3	739, 893	136	125	282, 566	17, 375	265, 590	32. 6
1922	61, 397	13. 8	846, 673	98. 9	837, 470	122	114	224, 900	20, 031	205, 079	23. 6
1923	56, 920	13. 3	759, 506	91. 4	694, 363	119	102	159, 880	28, 079	131, 892	16. 5
1924	*50, 862*	*15. 7*	*800, 877*								
1924	52, 460	16. 0	840, 091	130. 9	1, 099, 262	155	158	260, 803	6, 201	254, 695	29. 5
1925	52, 441	12. 8	668, 982	140. 5	940, 101	166	164	108, 035	15, 679	92, 669	13. 7
1926	56, 815	14. 7	833, 544	120. 7	1, 006, 345	140	138	219, 100	13, 264	205, 994	24. 8
1927	59, 628	14. 7	874, 633	111. 8	977, 406	140	140	206, 259	15, 734	190, 578	21. 7
1928	59, 309	15. 6	926, 130	98. 1	908, 084	118	138	163, 687	21, 442	142, 301	15. 6
1929	*62, 000*	*12. 9*	*800, 649*								
1929	62, 671	13. 0	812, 573	[9] 103. 5	[10] 840, 658	127	130	153, 245	12, 956	140, 361	17. 3
1930	61, 140	14. 0	857, 427	[9] 67. 1	[10] 575, 385	84	86	131, 475	19, 059	112, 435	13. 1
1931	55, 344	16. 3	900, 219	[9] 39. 1	[10] 352, 151	56	52	135, 797	12, 886	123, 774	13. 7
1932 [11]	*55, 177*	*13. 2*	*726, 831*	[9] *35. 0*	[10] *254, 525*						

[9] Weighted average price for crop marketing season.
[10] Based on weighted average price for crop marketing season.
[11] Preliminary.

TABLE 2.—*Wheat, winter and spring: Acreage sown and harvested, and production, United States, 1919–1932*

Year	Winter wheat: Acreage sown in preceding fall	Winter wheat: Acreage harvested	Winter wheat: Average yield per acre	Winter wheat: Production	Durum wheat: Acreage harvested	Durum wheat: Average yield per acre	Durum wheat: Production	Other spring wheat: Acreage harvested	Other spring wheat: Average yield per acre	Other spring wheat: Production
	1,000 acres	*1,000 acres*	*Bushels*	*1,000 bushels*	*1,000 acres*	*Bushels*	*1,000 bushels*	*1,000 acres*	*Bushels*	*1,000 bushels*
1919	51, 391	50, 404	14. 8	748, 460	3, 893	7. 3	28, 324	19, 403	9. 0	175, 313
1920	45, 505	40, 409	15. 2	613, 227	4, 400	9. 9	43, 550	17, 549	10. 6	186, 532
1921	45, 479	43, 160	14. 0	602, 793	6, 009	9. 0	54, 212	15, 397	10. 5	161, 959
1922	47, 415	41, 649	13. 7	571, 459	5, 659	14. 5	82, 245	14, 089	13. 7	192, 969
1923	45, 408	38, 712	14. 3	555, 323	4, 064	9. 6	38, 961	14, 144	11. 7	165, 222
1924	38, 635	35, 415	16. 1	571, 558	3, 674	16. 1	59, 114	13, 371	15. 7	209, 419
1925	40, 920	31, 962	12. 5	400, 970	4, 158	14. 0	58, 010	16, 321	12. 9	210, 002
1926	40, 603	37, 596	16. 8	631, 950	4, 577	9. 3	42, 469	14, 642	10. 9	159, 125
1927	44, 134	38, 195	14. 3	547, 666	5, 445	14. 4	78, 359	15, 988	15. 5	248, 608
1928	48, 347	36, 964	16. 0	591, 017	6, 804	14. 1	95, 802	15, 541	15. 4	239, 311
1929	43, 340	40, 580	14. 2	577, 009	5, 571	9. 8	54, 710	16, 520	10. 9	180, 854
1930	43, 562	39, 463	15. 2	599, 593	4, 745	12. 2	57, 719	16, 932	11. 8	200, 115
1931	43, 520	41, 357	19. 0	787, 393	2, 960	7. 0	20, 712	11, 027	8. 4	92, 114
1932 [1]	40, 420	33, 656	13. 7	462, 151	3, 863	10. 3	39, 868	17, 658	12. 7	224, 812

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Revised, 1919 to 1928. See introductory text.

[1] Preliminary.

Table 3.—*Winter wheat: Acreage seeded, by States, average 1924–1928, annual 1929–1932*

State and division	Area sown in autumn of— Average, 1924–1928	1929	1930	1931	1932 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*
N. Y.	201	233	202	194	213
N. J.	60	54	49	48	49
Pa.	1,077	1,001	935	898	898
N. A.	1,428	1,288	1,186	1,140	1,160
Ohio	1,870	1,884	1,730	1,592	1,831
Ind.	1,950	1,687	1,727	1,480	1,539
Ill.	2,494	1,978	1,845	1,495	1,510
Mich.	847	715	712	698	803
Wis.	58	34	25	38	44
Minn.	206	182	157	172	189
Iowa	415	394	324	281	239
Mo.	1,770	1,358	1,505	1,473	1,311
S. Dak.	124	101	247	288	403
Nebr.	3,612	3,847	3,496	3,042	2,890
Kans.	12,153	12,958	12,876	11,711	11,477
N. C.	25,499	25,138	24,644	22,270	22,236
Del.	106	106	96	81	81
Md.	500	488	430	400	408
Va.	631	599	615	588	559
W. Va.	117	106	116	117	116
N. C.	370	277	344	380	399
S. C.	57	35	54	82	74
Ga.	77	28	51	77	73
S. A.	1,858	1,639	1,706	1,725	1,710
Ky.	266	209	260	307	304
Tenn.	375	210	256	280	286
Ala.	3	2	4	6	6
Ark.	26	19	37	34	31
Okla.	4,705	4,576	4,615	4,407	4,275
Tex.	2,684	3,677	4,075	4,035	3,833
S. C.	8,059	8,693	9,247	9,069	8,735
Mont.	787	900	824	772	811
Idaho	614	761	647	701	666
Wyo.	95	189	210	169	135
Colo.	1,757	1,603	1,433	1,218	877
N. Mex.	268	377	377	379	300
Ariz.	26	22	24	29	44
Utah	167	200	204	192	200
Nev.	4	2	3	1	2
Wash.	1,198	1,215	1,412	1,284	1,412
Oreg.	927	877	868	782	899
Calif.	779	658	735	689	656
West	6,622	6,804	6,737	6,216	6,061
U. S.	43,466	43,562	43,520	40,420	39,902

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 4.—*Wheat, all: Acreage, production, and weighted average price, by States, average 1924–1928, annual 1929–1932*

State and division	Acreage harvested					Production					Weighted average price per bushel, crop-marketing season	
	Average, 1924–1928	1929	1930	1931	1932 [1]	Average, 1924–1928	1929	1930	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Maine	4	2	2	2	3	88	46	44	44	66	77	75
Vermont	2	1	1	1	------	34	18	20	21	------	73	------
New York	306	242	224	211	201	5, 564	3, 864	4, 086	5, 311	4, 086	57	51
New Jersey	58	54	53	49	48	1, 236	1, 107	1, 246	1, 323	1, 008	61	56
Pennsylvania	1, 080	987	986	909	898	18, 849	17, 278	21, 682	19, 987	13, 465	56	54
North Atlantic	1, 450	1, 286	1, 266	1, 172	1, 150	25, 771	22, 313	27, 078	26, 686	18, 625	56. 5	53. 3
Ohio	1, 524	1, 564	1, 612	1, 723	1, 585	27, 153	30, 503	28, 712	50, 744	32, 456	45	43
Indiana	1, 629	1, 568	1, 584	1, 725	1, 450	26, 037	25, 909	28, 527	44, 544	23, 214	40	39
Illinois	2, 166	2, 093	1, 921	1, 935	1, 549	35, 075	30, 831	35, 086	45, 076	23, 433	40	39
Michigan	816	790	705	711	701	15, 736	13, 682	16, 160	18, 426	16, 774	46	40
Wisconsin	116	96	99	88	106	2, 297	1, 881	2, 063	1, 544	2, 032	57	49
Minnesota	1, 829	1, 421	1, 387	1, 224	1, 367	26, 674	20, 471	23, 776	18, 011	19, 506	51	38
Iowa	431	426	432	357	298	8, 143	7, 977	8, 869	7, 321	4, 898	40	35
Missouri	1, 587	1, 534	1, 275	1, 497	1, 332	20, 822	15, 400	17, 838	29, 933	14, 926	40	38
North Dakota	9, 626	10, 440	9, 896	6, 295	10, 325	122, 600	99, 950	108, 471	40, 216	107, 156	46	32
South Dakota	2, 890	3, 583	3, 808	2, 796	3, 991	33, 537	34, 799	45, 279	16, 718	54, 095	43	30
Nebraska	3, 281	3, 700	3, 939	3, 465	2, 252	54, 508	55, 403	71, 557	58, 376	26, 620	34	30
Kansas	10, 007	12, 081	12, 357	12, 632	9, 270	137, 983	148, 544	166, 702	239, 868	106, 551	33	31
North Central	35, 900	39, 296	39, 015	34, 448	34, 226	510, 563	485, 350	553, 040	570, 777	431, 661	38. 0	33. 9
Delaware	102	106	105	91	79	1, 912	2, 014	2, 048	2, 138	908	50	52
Maryland	487	506	481	404	380	9, 187	9, 108	11, 063	9, 696	4, 940	50	52
Virginia	603	657	591	603	579	8, 643	8, 607	9, 160	13, 266	6, 253	56	56
West Virginia	112	104	105	113	116	1, 546	1, 362	1, 838	2, 373	1, 276	61	57
North Carolina	357	353	265	339	376	3, 777	3, 636	2, 862	4, 407	3, 572	71	65
South Carolina	54	52	34	53	80	555	520	340	689	760	78	64
Georgia	76	48	26	49	74	679	408	273	637	703	81	66
South Atlantic	1, 792	1, 826	1, 607	1, 652	1, 684	26, 299	25, 655	27, 584	33, 206	18, 412	57. 1	57. 3
Kentucky	204	204	202	252	270	2, 635	2, 530	2, 828	5, 544	2, 835	49	46
Tennessee	345	280	202	252	272	3, 852	2, 492	2, 222	4, 410	2, 584	62	56
Alabama	4	2	2	4	6	47	20	20	50	60	64	58
Arkansas	25	17	18	36	31	253	158	203	475	248	49	44
Oklahoma	4, 010	4, 576	3, 935	4, 407	3, 966	52, 072	51, 251	37, 382	74, 919	43, 626	33	30
Texas	1, 798	2, 970	3, 089	3, 892	2, 958	22, 749	44, 550	32, 434	56, 045	29, 580	36	31
South Central	6, 386	8, 049	7, 448	8, 843	7, 503	81, 607	101, 001	75, 089	141, 443	78, 933	35. 8	31. 9
Montana	3, 677	4, 419	4, 217	2, 182	4, 070	58, 210	41, 290	35, 313	14, 478	55, 610	50	30
Idaho	1, 090	1, 294	1, 245	981	1, 192	24, 125	28, 835	29, 960	17, 577	30, 656	34	30
Wyoming	237	341	343	240	232	3, 449	4, 394	4, 014	2, 192	2, 442	44	27
Colorado	1, 536	1, 539	1, 553	1, 386	680	19, 746	17, 934	21, 574	16, 632	6, 699	33	34
New Mexico	155	320	211	387	251	1, 834	4, 435	1, 904	6, 966	1, 754	35	35
Arizona	27	19	22	24	29	505	475	616	672	609	74	54
Utah	228	265	276	257	260	4, 981	5, 304	6, 892	4, 291	5, 332	52	40
Nevada	16	14	13	14	18	386	352	328	319	461	79	59
Washington	1, 999	2, 295	2, 305	2, 357	2, 298	39, 207	42, 721	38, 278	40, 843	44, 903	37	37
Oregon	1, 008	1, 075	1, 027	945	991	20, 754	21, 500	23, 621	17, 662	20, 060	38	40
California	627	633	592	456	593	11, 209	11, 014	12, 136	6, 475	10, 674	58	55
Western	10, 600	12, 214	11, 804	9, 229	10, 614	184, 406	178, 254	174, 636	128, 107	179, 200	39. 5	35. 0
United States	56, 128	62, 671	61, 140	55, 344	55, 177	828, 647	812, 573	857, 427	900, 219	726, 831	39. 1	35. 0

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 5.—*Wheat, winter, spring, and durum: Acreage, yield, and production, by States, averages, and annual 1931 and 1932*

WINTER WHEAT

State and division	Acreage harvested			Yield per acre			Production		
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
New York	297	201	191	19.2	25.5	20.5	5,387	5,126	3,916
New Jersey	58	49	48	19.8	27.0	21.0	1,236	1,323	1,008
Pennsylvania	1,073	898	889	17.2	22.0	15.0	18,735	19,756	13,335
North Atlantic	1,428	1,148	1,128	17.8	22.8	16.2	25,358	26,205	18,259
Ohio	1,514	1,713	1,576	16.5	29.5	20.5	26,951	50,534	32,308
Indiana	1,622	1,710	1,436	14.9	25.9	16.0	25,929	44,289	22,976
Illinois	2,054	1,836	1,450	16.4	23.5	15.0	32,889	43,146	21,750
Michigan	810	701	691	18.1	26.0	24.0	15,626	18,226	16,584
Wisconsin	57	24	36	18.0	19.0	19.5	1,135	456	702
Minnesota	156	152	163	17.8	21.0	21.0	2,896	3,192	3,423
Iowa	388	313	250	19.4	21.0	17.0	7,471	6,573	4,250
Missouri	1,579	1,490	1,326	13.0	20.0	11.2	20,715	29,800	14,851
South Dakota	102	185	259	13.4	6.3	19.0	1,364	1,166	4,921
Nebraska	3,100	3,339	2,050	15.3	17.2	12.0	51,796	57,431	24,600
Kansas	9,990	12,618	9,252	13.3	19.0	11.5	137,823	239,742	106,398
North Central	21,370	24,081	18,489	14.7	20.5	13.7	324,595	494,555	252,763
Delaware	102	91	79	16.8	23.5	11.5	1,912	2,138	908
Maryland	487	404	380	17.8	24.0	13.0	9,187	9,696	4,940
Virginia	603	603	579	13.4	22.0	10.8	8,643	13,266	6,253
West Virginia	112	113	116	13.0	21.0	11.0	1,546	2,373	1,276
North Carolina	357	339	376	9.6	13.0	9.5	3,777	4,407	3,572
South Carolina	54	53	80	9.4	13.0	9.5	555	689	760
Georgia	76	49	74	8.4	13.0	9.5	679	637	703
South Atlantic	1,792	1,652	1,684	13.6	20.1	10.9	26,299	33,206	18,412
Kentucky	204	252	270	12.0	22.0	10.5	2,635	5,544	2,835
Tennessee	345	252	272	10.4	17.5	9.5	3,852	4,410	2,584
Alabama	4	4	6	10.4	12.5	10.0	47	50	60
Arkansas	25	36	31	9.8	13.2	8.0	253	475	248
Oklahoma	4,010	4,407	3,966	12.6	17.0	11.0	52,072	74,919	43,626
Texas	1,798	3,892	2,958	11.8	14.4	10.0	22,749	56,045	29,580
South Central	6,386	8,843	7,503	12.2	16.0	10.5	81,607	141,443	78,933
Montana	576	412	618	14.8	9.5	20.0	9,429	3,914	12,360
Idaho	519	621	652	19.0	17.0	23.0	10,071	10,557	14,996
Wyoming	64	164	110	15.6	8.5	10.0	1,084	1,394	1,100
Colorado	1,242	1,218	487	12.6	12.0	9.0	15,123	14,616	4,383
New Mexico	123	360	220	11.1	18.0	6.0	1,466	6,480	1,320
Arizona	27	24	29	19.5	28.0	21.0	505	672	609
Utah	154	194	184	17.7	14.0	17.0	2,959	2,716	3,128
Nevada	4	3	1	22.7	22.0	19.0	106	66	19
Washington	960	1,356	1,207	23.4	22.0	25.0	22,594	29,832	30,175
Oregon	751	825	751	21.7	18.5	20.0	16,198	15,262	15,020
California	627	456	593	17.5	14.2	18.0	11,209	6,475	10,674
Western	5,047	5,633	4,852	17.8	16.3	19.3	90,744	91,984	93,784
United States	36,024	41,357	33,656	14.8	19.0	13.7	548,004	787,393	462,151

[1] Preliminary.

TABLE 5.—*Wheat, winter, spring, and durum. Acreage, yield, and production, by States, averages, and annual 1931 and 1932*—Continued

SPRING WHEAT OTHER THAN DURUM

State and division	Acreage harvested			Yield per acre			Production		
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	4	2	3	20.7	22.0	22.0	88	44	66
Vermont	2	1		18.5	21.0		34	21	
New York	9	10	10	17.4	18.5	17.0	177	185	170
Pennsylvania	7	11	9	15.5	21.0	14.5	114	231	130
North Atlantic	22	24	22	17.7	20.0	16.6	413	481	360
Ohio	10	10	9	19.2	21.0	16.5	202	210	148
Indiana	7	15	14	15.7	17.0	17.0	108	255	238
Illinois	112	99	99	18.5	19.5	17.0	2,185	1,930	1,683
Michigan	6	10	10	15.6	20.0	19.0	110	200	190
Wisconsin	59	64	70	17.1	17.0	19.0	1,162	1,088	1,330
Minnesota	1,465	946	1,078	12.4	13.8	13.4	20,763	13,055	14,445
Iowa	43	44	48	13.9	17.0	13.5	672	748	648
Missouri	8	7	6	12.8	19.0	12.5	107	133	75
North Dakota	5,975	4,318	7,557	10.5	6.2	10.7	72,339	26,772	80,860
South Dakota	1,755	1,774	2,803	9.8	5.7	13.5	19,298	10,112	37,840
Nebraska	181	126	202	12.4	7.5	10.0	2,712	945	2,020
Kansas	17	14	18	8.4	9.0	8.5	160	126	153
North Central	9,638	7,427	11,914	11.0	7.5	11.7	119,818	55,574	139,630
Montana	3,061	1,750	3,412	13.7	6.0	12.5	48,181	10,500	42,650
Idaho	571	360	540	22.8	19.5	20.0	14,054	7,020	15,660
Wyoming	173	76	122	12.8	10.5	11.0	2,365	798	1,342
Colorado	294	168	193	15.6	12.0	12.0	4,623	2,016	2,316
New Mexico	32	27	31	11.8	18.0	14.0	367	486	434
Utah	74	63	76	25.6	25.0	29.0	2,022	1,575	2,204
Nevada	12	11	17	25.1	23.0	26.0	281	253	442
Washington	1,040	1,001	1,091	14.8	11.0	13.5	16,613	11,011	14,728
Oregon	256	120	240	16.4	20.0	21.0	4,556	2,400	5,040
Western	5,513	3,576	5,722	15.7	10.1	14.8	93,062	36,059	84,816
United States	15,173	11,027	17,658	12.6	8.4	12.7	213,293	92,114	224,812

DURUM WHEAT

Minnesota	208	126	126	13.9	14.0	13.0	3,015	1,764	1,638
North Dakota	3,651	1,977	2,768	11.6	6.8	9.5	50,261	13,444	26,296
South Dakota	1,033	837	929	12.4	6.5	12.2	12,874	5,440	11,334
Montana	40	20	40	12.7	3.2	15.0	600	64	600
Total	4,932	2,960	3,863	11.8	7.0	10.3	66,751	20,712	39,868

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 6.—*Wheat: World production, 1890–91 to 1932–33*

Crop year	World production, excluding Russia and China	Northern Hemisphere production, excluding Russia and China	European production, excluding Russia	Selected countries						
				Russia [1]	United States	Canada	India	Argentina	Australia	France
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1890–91	1,878	1,802	1,056	212	378	42	229	31	27	330
1891–92	1,989	1,904	900	173	585	42	257	36	28	215
1892–93	2,053	1,938	1,045	255	528	48	227	50	33	311
1893–94	2,076	1,936	1,097	375	428	41	286	82	37	278
1894–95	2,128	2,018	1,080	355	516	43	271	61	28	344
1895–96	2,126	2,039	1,057	310	569	41	261	46	18	340
1896–97	2,057	1,986	1,103	412	544	33	201	32	21	340
1897–98	1,893	1,790	842	340	610	47	200	53	28	242
1898–99	2,552	2,374	1,168	459	772	63	209	105	41	365
1899–1900	2,319	2,150	1,113	454	636	57	255	102	40	365
1900–1901	2,210	2,064	1,096	423	603	56	200	75	48	326
1901–2	2,472	2,357	1,103	428	789	85	205	56	39	311
1902–3	2,510	2,368	1,207	607	725	94	227	104	12	328
1903–4	2,661	2,412	1,266	621	664	78	298	130	74	363
1904–5	2,478	2,238	1,116	667	597	69	360	151	55	300
1905–6	2,673	2,441	1,223	636	727	106	283	135	69	335
1906–7	2,950	2,694	1,356	543	757	126	320	166	66	329
1907–8	2,619	2,344	1,176	571	638	93	317	192	45	381
1908–9	2,544	2,283	1,181	628	645	112	229	156	63	317
1909–10	2,819	2,554	1,240	846	700	167	285	131	90	359
1910–11	2,777	2,495	1,201	836	635	132	360	146	95	253
1911–12	3,043	2,758	1,347	563	621	231	376	166	72	322
1912–13	3,093	2,770	1,284	801	730	224	371	187	92	334
1913–14	3,098	2,853	1,301	1,028	763	232	368	105	103	319
1914–15	2,834	2,601	1,072	[2] 834	891	161	312	169	25	283
1915–16	*3,497*	*3,102*	*1,125*	[3] *827*	*1,026*	*394*	*377*	*169*	*179*	*223*
1916–17	2,734	2,457	1,049	[4] 531	636	263	323	84	152	206
1917–18	2,574	2,178	740	622	637	234	382	235	115	[5] 135
1918–19	2,911	2,608	909	--------	921	189	370	180	76	229
1919–20	2,809	2,504	900	--------	952	193	280	217	46	187
1920–21	2,968	2,612	949	320	843	263	378	156	146	237
1921–22	3,177	2,795	1,222	205	819	301	250	191	129	323
1922–23	3,203	2,845	1,044	243	847	400	367	196	109	243
1923–24	3,519	3,087	1,257	419	760	474	372	248	125	276
1924–25	3,126	2,715	1,058	472	840	262	361	191	165	281
1925–26	3,380	3,013	1,397	782	669	395	331	191	115	330
1926–27	3,496	3,045	1,210	914	834	407	325	230	161	232
1927–28	3,671	3,198	1,275	785	875	480	335	282	118	276
1928–29	4,011	3,431	1,410	807	926	567	291	349	160	281
1929–30	3,561	3,194	1,450	694	813	305	321	163	127	337
1930–31	3,813	3,312	1,362	989	857	421	391	232	214	228
1931–32	3,771	3,297	1,434	--------	900	304	347	220	190	264
1932–33 [6]	3,760	3,260	1,499	--------	727	431	337	231	200	331

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1932–33 the crop harvested in the Northern Hemisphere countries in 1932 is combined with the Southern Hemisphere harvest which begins late in 1932 and ends early in 1933.

[1] Includes all Russian territory reporting for years named.
[2] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of present Latvia and Ukraine, and two Provinces of Transcaucasia.
[4] Beginning with this date estimated production is within present boundaries of the Union of Socialist Soviet Republics, excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924 produced 51,706,000 bushels and, in 1925, 58,000,000 bushels.
[5] Beginning with this date production is within postwar boundaries and therefore not comparable with earlier years.
[6] Preliminary.

TABLE 7.—*Wheat: Acreage, yield per acre, and production in specified countries; average, 1921–22 to 1925–26; annual, 1929–30 to 1932–33*

Country	Acreage					Yield per acre					Production				
	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33[1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33[1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33[1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
North America:															
Canada	22,083	25,255	24,898	26,115	27,182	16.6	12.1	16.9	11.6	15.9	366,483	304,520	420,672	304,144	431,200
United States	57,557	62,671	61,140	55,344	55,177	13.7	13.0	14.0	16.3	13.2	786,843	812,573	857,427	900,219	726,831
Mexico	2,098	1,293	1,216	1,501	1,066	5.0	8.8	9.4	10.8	8.4	10,388	11,333	11,446	16,226	8,921
Guatemala	24	18	23			9.2	10.4	8.1			222	187	186	473	
Europe:															
United Kingdom—															
England and Wales	1,746	1,330	1,346	1,197	1,288	33.7	35.7	29.7	30.0	32.0	58,800	47,451	39,960	35,896	41,238
Scotland	57	51	54	50	52	39.5	42.5	39.4	35.8	43.1	2,251	2,165	2,128	1,792	2,240
Northern Ireland	6	4	5	3	3	30.8	35.5	34.2	35.3		185	142	171	106	
Irish Free State	34	29	27	21	21	33.3	40.8	40.4	37.2		1,131	1,184	1,092	781	
Norway	27	30	30	29	28	23.6	25.0	24.0	20.4	28.0	637	750	720	592	785
Sweden	352	574	647	683	747	30.1	33.1	32.2	26.4	34.6	10,602	19,011	20,819	18,048	25,830
Denmark	202	260	249	259	245	44.4	45.3	41.0	38.8		8,973	11,772	10,216	10,053	
Netherlands	147	112	142	192	293	42.6	48.8	42.6	35.2	46.7	6,262	5,467	6,055	6,761	13,694
Belgium	339	356	411	381	391	38.9	37.1	32.2	36.3	38.6	13,194	13,225	13,236	13,817	15,099
Luxemburg	23	21	25	23	22	17.0	13.1	17.7	17.7	22.5	392	275	442	407	496
France	13,507	13,336	13,279	12,840	13,234	21.5	25.3	17.2	20.6	25.0	290,774	337,252	228,105	264,117	331,350
Spain	10,457	10,622	11,133	11,245	11,189	13.6	14.5	13.2	12.0	15.9	142,420	154,245	146,700	134,427	178,282
Portugal	1,078	1,075	1,120	1,271		10.3	9.9	12.3	10.2		11,103	10,636	13,816	12,999	18,138
Italy	11,575	11,794	11,917	11,884	12,237	17.1	22.1	17.6	20.6	22.6	198,307	260,125	210,071	244,784	276,128
Switzerland	112	134	134	134	137	30.9	32.6	26.9	32.5	30.5	3,457	4,372	3,601	4,361	4,182
Germany	3,613	3,955	4,401	5,355	5,635	27.3	31.1	31.6	29.0	32.6	98,714	123,062	139,217	155,546	183,827
Austria	456	515	508	517	536	18.4	22.4	23.6	21.3	24.3	8,400	11,559	12,008	11,000	13,007
Czechoslovakia	1,526	2,017	1,965	2,060	2,064	23.6	26.2	25.8	20.0	26.0	36,015	52,902	50,606	41,232	53,737
Hungary	3,345	3,708	4,187	4,011	3,897	17.8	20.2	20.1	18.1	15.0	59,678	74,985	84,339	72,550	58,593
Yugoslavia	3,953	5,213	5,246	5,395	4,820	14.9	18.2	15.3	18.3	11.1	58,753	94,999	80,326	98,789	53,444
Greece	1,075	1,237	1,432	1,496		8.8	9.2	6.8	7.5		9,417	11,434	9,709	11,228	19,474
Bulgaria	2,390	2,662	3,006	2,831	3,077	13.1	12.5	19.1	21.6	16.4	31,399	33,195	57,317	61,195	50,553
Rumania	7,068	6,704	7,551	8,566	7,091	12.7	14.7	17.3	15.8	10.4	89,570	99,753	130,771	135,300	73,486
Poland	2,957	3,526	4,060	4,495	4,261	16.5	18.7	20.2	18.5	13.1	48,708	65,862	82,321	83,220	55,888
Lithuania	214	488	526	478	514	16.6	19.1	21.5	17.4	18.2	3,563	9,329	11,327	8,340	9,359
Latvia	89	145	179	215	255	16.0	16.1	22.7	15.8	19.9	1,426	2,338	4,062	3,388	5,084
Estonia	47	82	90	90	128	14.2	15.4	18.2	17.5	16.2	667	1,260	1,635	1,736	2,072

Finland	36	34	51	47	50	20.5	22.5	23.7	24.7	25.2	739	764	1,210	1,161	1,260
Russia	43,128	73,457	80,490	92,070	88,724	9.8	9.4	12.3			424,233	693,634	989,161		
Estimated European total, excluding Russia	66,400	70,100	73,700	75,800	75,000						1,196,000	1,450,000	1,362,000	1,434,000	1,499,000
Africa:															
Morocco	2,272	3,011	2,957	2,537	2,450	9.6	10.5	7.2	11.7	9.0	21,758	31,764	21,302	29,783	21,965
Algeria	3,406	3,795	4,028	3,640	3,695	7.8	8.8	8.1	7.0	8.1	26,716	33,307	32,442	25,649	29,982
Tunis	1,400	1,732	1,903	1,977	2,100	5.6	7.1	5.5	7.1	7.0	7,892	12,309	10,398	13,963	14,697
Egypt	1,462	1,614	1,522	1,649	1,762	25.2	28.0	26.1	27.9	29.8	36,806	45,228	39,753	46,073	52,586
Asia:															
Turkey	[2] 7,058	6,355	6,101	7,706		[2] 5.6	15.7	15.0	14.3		[2] 39,510	99,900	91,322	110,230	69,812
India	29,580	31,973	31,654	32,189	33,749	11.4	10.0	12.3	10.8	10.0	336,269	320,731	390,843	347,387	336,971
Japanese Empire:															
Japan	1,197	1,213	1,204	1,228	1,235	22.5	25.1	24.5	25.2	25.4	26,899	30,496	29,537	30,892	31,336
Chosen	882	874	848	817		11.6	9.5	10.6	10.2		10,208	8,320	8,985	8,341	8,305
Taiwan	7	1	1			9.1	13.0	13.0			64	13	13		
Kwantung	4	3	3			11.8	11.7	15.3			47	35	46		
Estimated Asiatic total, excluding Russia and China	38,600	42,400	42,000	44,100	45,700						437,000	491,000	555,000	525,000	473,000
Estimated Northern Hemisphere total, excluding Russia and China	195,500	212,000	213,600	212,800	214,200						2,891,000	3,194,000	3,312,000	3,297,000	3,260,000
SOUTHERN HEMISPHERE															
Chile	1,446	1,725	1,610	1,517	1,466	17.8	19.4	13.2	14.0	14.9	25,761	33,529	21,190	21,187	21,793
Uruguay	867	1,097	864	1,080	843	11.2	12.0	8.5	10.4		9,680	13,157	7,369	11,259	
Argentina	16,932	15,903	19,675	16,028	[3] 19,790	12.0	10.2	11.8	13.7	[4] 11.7	203,388	162,576	232,285	219,698	231,483
Union of South Africa	868	1,152	1,137	1,723		8.6	9.2	8.2	8.2		7,451	10,626	9,297	14,122	
Australia	10,010	14,977	18,165	14,725	15,585	12.8	8.5	11.8	12.9	12.8	128,520	126,885	213,594	189,653	200,000
New Zealand	224	236	249	269		29.6	30.7	30.4	24.5		6,640	7,240	7,579	6,583	
Estimated Southern Hemisphere total	31,000	40,700	44,200	37,400	40,500						390,000	367,000	501,000	474,000	500,000
Estimated world total, excluding Russia and China	226,500	252,700	257,800	250,200	254,700						3,281,000	3,561,000	3,813,000	3,771,000	3,760,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus, for 1932–33 the crop harvested in the Northern Hemisphere countries in 1932 is combined with the Southern Hemisphere harvest which begins late in 1932 and ends early in 1933.

[1] Preliminary. [2] Year 1925. [3] Area sown. [4] Computed on sown acreage.

TABLE 8.—*Wheat, all: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning June	Percentage of receipts during crop year													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1922–23	1.2	13.8	17.3	14.4	12.1	8.8	7.7	5.5	4.9	4.4	3.7	3.6	2.6	100
1923–24	1.1	13.8	17.5	15.7	13.0	9.2	6.4	4.7	5.1	3.6	3.0	4.0	2.9	100
1924–25	2.1	12.9	20.8	17.8	14.0	7.8	5.6	5.3	4.2	2.5	1.7	3.3	2.0	100
1925–26	2.3	14.0	18.2	18.2	11.2	9.0	7.2	4.8	4.1	3.0	3.0	2.9	2.1	100
1926–27	1.7	22.2	20.6	13.5	9.5	5.9	5.1	4.6	4.7	3.7	2.7	3.5	2.3	100
1927–28	2.7	15.0	18.0	19.8	12.6	7.8	5.3	4.5	4.0	3.8	2.5	2.7	1.3	100
1928–29	1.3	19.0	18.3	17.2	12.0	7.2	5.4	4.2	4.3	3.5	2.8	2.7	2.1	100
1929–30	5.1	25.5	22.3	14.0	8.6	4.8	4.5	3.1	2.9	2.5	2.5	2.6	1.6	100
1930–31	3.9	25.2	21.0	12.3	7.1	4.5	4.7	4.7	4.7	3.5	3.1	3.9	1.4	100
1931–32	3.1	20.2	24.3	11.3	7.7	5.8	4.2	4.2	4.4	5.0	3.4	3.7	2.7	100

Bureau of Agricultural Economics.

TABLE 9.—*Wheat: Production and farm disposition, United States, 1924–1932*

Year	Production	Used for seed		Fed to livestock [1]	Ground at mills for home use or exchanged for flour [1]	Sold or for sale
		Total	Home grown [1]			
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1924	840,091	80,951	80,072	55,855	10,553	693,611
1925	668,982	79,535	75,620	28,232	10,487	554,643
1926	833,544	85,065	82,971	34,383	10,343	705,847
1927	874,633	92,693	90,088	44,453	9,286	730,806
1928	926,130	85,375	83,231	55,486	8,196	779,217
1929	812,573	84,882	84,199	56,926	6,973	664,475
1930	857,427	81,955	81,181	158,937	10,538	606,771
1931	900,219	80,785	77,996	167,356	14,917	639,950
1932 [2]	726,831	80,475	78,952	138,307	16,279	493,233

Bureau of Agricultural Economics. Estimates of Crop Reporting Board.

[1] Relates to quantities used by producers on their own farms. Additional quantities of purchased wheat are so utilized.
[2] *Preliminary. Disposition items are approximations made in March, 1933.*

TABLE 10.—*Wheat: Receipts inspected, all inspection points, United States, by months, 1923–24 to 1932–33*

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushel*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1923–24	80,391	104,682	72,726	65,907	58,718	45,287	30,216	37,436	28,772	21,012	31,078	29,020	605,245
1924–25	91,850	148,100	125,347	129,769	84,376	49,217	37,809	35,642	31,922	18,568	28,179	32,341	813,120
1925–26	70,715	75,495	84,804	49,370	57,292	53,128	32,040	30,202	26,305	25,310	29,206	43,857	577,724
1926–27	158,298	134,553	90,938	67,998	51,875	42,163	42,536	44,334	40,291	35,914	40,579	43,636	792,215
1927–28	103,236	118,828	127,067	104,410	73,841	49,513	43,417	40,325	43,928	31,061	38,214	24,606	798,446
1928–29	145,487	126,043	114,787	117,295	73,392	61,513	41,603	48,536	45,028	31,494	36,536	51,173	892,887
1929–30	209,371	152,871	82,242	57,525	32,495	40,912	29,461	35,931	25,663	22,629	30,615	55,812	775,527
1930–31	194,589	135,477	84,161	48,238	33,914	38,770	47,376	46,201	42,311	32,583	46,533	55,151	805,304
1931–32	191,863	100,171	61,164	56,469	43,629	29,624	34,132	48,240	23,845	25,220	30,327	33,249	677,933
1932–33	99,116	75,170	63,101	40,650	28,129								

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain inspection. The quantity loaded per car varies, but car-lot receipts have been converted to bushels by using a factor of 1,300 bushels to a car.

TABLE 11.—*Wheat: Receipts inspected, all inspection points, by classes, and grades, 1927–28 to 1931–32*

Class and year beginning July	Grade						Total
	No. 1	No. 2	No. 3	No. 4	No. 5	Sample	
Hard red spring:	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1927–28	106, 285	56, 839	41, 268	18, 763	6, 200	11, 939	241, 294
1928–29	110, 602	36, 986	22, 562	8, 462	4, 625	40, 812	224, 049
1929–30	76, 072	24, 489	13, 376	2, 759	980	5, 602	123, 278
1930–31	76, 942	25, 971	27, 161	9, 455	2, 547	932	143, 008
1931–32	18, 216	9, 199	9, 129	2, 740	1, 382	528	41, 194
Durum:							
1927–28	11, 331	31, 170	9, 692	5, 567	2, 147	2, 414	62, 321
1928–29	5, 248	33, 789	14, 652	9, 169	5, 478	5, 508	73, 844
1929–30	4, 340	20, 261	4, 206	1, 894	1, 258	880	32, 839
1930–31	7, 496	28, 660	4, 062	1, 464	509	307	42, 498
1931–32	1, 126	7, 444	1, 136	327	134	64	10, 231
Hard red winter:							
1927–28	100, 204	123, 475	41, 434	19, 331	11, 127	14, 664	310, 295
1928–29	141, 045	168, 205	69, 541	28, 330	18, 914	16, 836	442, 871
1929–30	99, 115	202, 095	110, 720	34, 014	11, 495	13, 022	470, 467
1930–31	209, 130	170, 336	45, 361	19, 505	10, 586	7, 003	461, 921
1931–32	228, 621	201, 104	45, 692	11, 257	8, 703	6, 246	501, 623
Soft red winter:							
1927–28	10, 563	25, 795	13, 659	7, 942	2, 305	3, 371	63, 635
1928–29	8, 317	15, 856	7, 416	4, 924	1, 654	3, 967	42, 134
1929–30	4, 933	25, 803	19, 668	4, 107	970	1, 709	57, 190
1930–31	35, 847	12, 637	2, 427	610	392	395	52, 308
1931–32	15, 644	33, 579	11, 375	3, 093	1, 237	1, 303	66, 231
White:							
1927–28	17, 822	25, 819	8, 733	3, 072	1, 370	3, 492	60, 308
1928–29	17, 412	19, 438	2, 791	650	228	322	40, 841
1929–30	13, 098	22, 785	3, 667	481	131	346	40, 508
1930–31	11, 786	26, 113	5, 122	568	130	207	43, 926
1931–32	11, 934	18, 622	4, 611	431	82	82	35, 762
Mixed:							
1927–28	14, 807	22, 624	12, 042	5, 570	2, 453	3, 097	60, 593
1928–29	14, 150	23, 338	13, 111	8, 395	5, 621	4, 533	69, 148
1929–30	11, 187	20, 687	11, 454	3, 914	2, 076	1, 927	51, 245
1930–31	22, 092	23, 589	8, 540	4, 582	1, 790	1, 050	61, 643
1931–32	8, 466	8, 791	4, 010	868	493	264	22, 892
Total:							
1927–28	261, 072	285, 722	126, 828	60, 245	25, 602	38, 977	798, 446
1928–29	296, 774	297, 612	130, 073	59, 930	36, 520	71, 978	892, 887
1929–30	208, 745	316, 120	163, 097	47, 169	16, 910	23, 486	775, 527
1930–31	363, 293	287, 306	92, 673	36, 184	15, 954	9, 894	805, 304
1931–32	284, 007	278, 739	75, 953	18, 716	12, 031	8, 487	677, 933

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain inspection. See 1927 Yearbook, p. 752, for data for earlier years. The quantity loaded per car varies, but car-lot receipts have been converted to bushels by using a factor of 1,300 bushels to a car.

TABLE 12.—*Wheat: Commercial stocks, 1926–27 to 1932–33*

DOMESTIC WHEAT IN UNITED STATES[1]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27							66, 340	56, 303	56, 262	49, 910	37, 667	27, 833
1927–28	21, 052	33, 677	62, 042	78, 811	89, 684	91, 589	88, 581	79, 152	72, 858	68, 791	61, 957	48, 286
1928–29	38, 587	52, 421	93, 870	115, 469	139, 493	140, 172	144, 351	129, 646	126, 377	124, 756	113, 392	96, 059
1929–30	90, 442	136, 423	186, 847	198, 211	202, 461	189, 926	185, 151	168, 346	160, 674	153, 122	135, 470	120, 303
1930–31	109, 327	161, 897	201, 319	223, 826	211, 381	206, 618	199, 649	202, 694	208, 651	214, 242	206, 490	209, 110
1931–32	203, 491	235, 727	261, 742	256, 327	244, 043	236, 616	226, 874	217, 719	216, 282	207, 215	186, 549	174, 118
1932–33	168, 405	175, 918	188, 342	194, 858	191, 829	176, 428						

[1] Includes wheat in store in public and private elevators in 42 important markets and also the wheat afloat in vessels or barges in the harbors of lake and seaboard ports. Wheat in transit either by rail or water, mill stocks, or small private stocks of wheat intended only for local purposes, not included.

TABLE 12.—*Wheat: Commercial stocks, 1926–27 to 1932–33*—Continued

UNITED STATES WHEAT IN CANADA

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27							1,067	549	437	378	746	1,344
1927–28	1,362	1,280	4,249	4,560	7,258	5,156	3,933	2,285	1,680	977	863	2,314
1928–29	2,506	2,258	2,546	3,295	8,602	8,280	7,328	3,930	2,139	1,586	1,738	4,865
1929–30	3,332	2,288	4,450	8,770	9,065	9,101	8,546	7,517	6,613	5,860	5,431	4,359
1930–31	4,729	3,961	3,812	4,699	4,756	4,790	4,819	4,802	4,951	4,891	5,897	7,851
1931–32	14,057	22,934	32,236	32,511	31,627	29,414	29,153	28,652	27,682	27,578	26,872	17,481
1932–33	15,895	15,364	11,334	8,503	7,728	7,000						

CANADIAN WHEAT IN UNITED STATES[2]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1926–27							23,394	14,500	9,532	6,650	10,724	16,749
1927–28	7,472	4,835	3,410	3,784	8,617	31,375	35,764	28,703	19,260	11,848	6,597	11,549
1928–29	11,132	13,605	3,789	7,548	18,291	33,902	46,717	38,327	32,851	23,854	28,772	25,538
1929–30	23,196	23,550	22,025	21,753	28,316	34,527	38,837	35,517	31,516	25,285	17,587	14,372
1930–31	16,435	16,468	12,603	17,304	22,112	30,297	32,266	26,954	18,085	13,990	2,766	5,926
1931–32	5,409	6,244	6,227	9,116	12,596	23,480	25,212	21,905	14,589	11,426	4,619	7,203
1932–33	4,532	4,707	5,581	10,988	13,917	15,197						

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the 1st day of the month.

[2] Includes wheat stored at lake and seaboard ports, exclusive of wheat in transit on lakes and canals.

TABLE 13.—*Wheat: Production, 1929–30 to 1932–33, and exports by classes, 1923–24 to 1931–32*

ESTIMATED PRODUCTION

Year beginning July	Hard red spring	Durum	Hard red winter	Soft red winter	White[1]	Mixed[2]	Flour as wheat	Other wheat	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1929–30	144,678	56,307	362,353	165,760	83,475				812,573
1930–31	160,554	59,191	373,984	175,245	88,453				857,427
1931–32	70,290	21,266	491,529	249,502	67,632				900,219
1932–33	187,562	40,813	264,933	147,742	85,781				726,831

INSPECTIONS FOR EXPORT AND OTHER EXPORTS OF DOMESTIC WHEAT AND FLOUR[3]

Year beginning July	Hard red spring	Durum	Hard red winter	Soft red winter	White[1]	Mixed[2]	Flour as wheat	Other wheat	Total
1923–24	1,022	4,908	19,640	9,810	18,653	5,435	81,087	19,325	159,880
1924–25	16,760	5,945	90,840	6,944	10,063	9,386	65,313	55,552	260,803
1925–26	3,338	4,170	7,358	2,282	16,914	5,944	44,846	23,183	108,035
1926–27	1,829	611	66,874	29,980	26,615	1,398	62,910	28,943	219,160
1927–28	5,209	3,496	41,603	9,915	28,150	1,874	60,260	55,752	206,259
1928–29	1,766	1,045	30,660	2,782	14,710	1,473	60,574	50,677	163,687
1929–30	1,490	360	49,290	2,547	17,527	751	61,070	20,210	153,245
1930–31	462	712	44,328	2,495	13,292	192	55,259	14,735	131,475
1931–32	29	1,432	72,017	2,126	13,895	217	39,276	6,806	135,797

Bureau of Agricultural Economics. Estimated production by classes based on questionnaire surveys of local authorities; supplemented by judgment of cereal specialists. Inspections of United States wheat for export data furnished monthly by Federal grain supervision officers at the export markets. Inspections are made at the ports of export. Export figures from reports of the Bureau of Foreign and Domestic Commerce.

[1] White wheat in the Pacific Northwest region consists of both spring and winter wheat; no attempt has been made to classify this wheat as other than white wheat, part of which is spring and part winter.

[2] Mixed wheats exported from Atlantic coast ports are estimated as approximately 70 per cent durum and the remainder as hard red spring; that exported from Gulf ports as approximately half and half hard and soft winter; and that exported from Pacific coast ports as approximately 90 per cent white and the remainder as hard and soft red winter wheats.

[3] *Designations by classes include all inspections for export. Flour as wheat is as reported by customs* offices. "Other wheat" comprises total domestic exports as reported by customs offices minus "inspections for export" and consists principally of exports through Canada from customs districts of Buffalo, Chicago, Duluth-Superior, Ohio, and Wisconsin.

TABLE 14.—*Wheat and wheat including flour: Exports from the United States, by months, 1922–23 to 1931–32*

WHEAT, GRAIN

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1922–23	14, 979	33, 703	25, 987	18, 282	10, 577	9, 676	7, 297	5, 991	4, 291	4, 943	9, 973	9, 252	154, 951
1923–24	8, 843	14, 198	15, 408	9, 239	4, 148	4, 950	4, 421	3, 095	2, 958	3, 747	2, 811	4, 975	78, 793
1924–25	4, 048	16, 835	32, 662	45, 128	27, 831	17, 791	8, 484	7, 387	9, 960	8, 424	9, 870	7, 070	195, 490
1925–26	5, 295	7, 901	9, 391	4, 354	4, 696	3, 695	2, 412	1, 700	3, 770	2, 533	9, 368	8, 074	63, 189
1926–27	16, 091	29, 075	23, 700	17, 589	14, 340	9, 622	8, 078	4, 889	5, 084	11, 363	8, 960	7, 459	156, 250
1927–28	8, 397	23, 418	33, 776	29, 236	20, 731	6, 917	5, 956	2, 276	2, 740	2, 723	4, 823	5, 006	145, 999
1928–29	4, 153	10, 374	17, 979	22, 058	10, 562	7, 641	3, 399	3, 214	3, 487	3, 942	11, 741	4, 564	103, 114
1929–30	8, 691	12, 004	13, 104	8, 767	9, 977	7, 149	8, 245	5, 185	2, 414	3, 050	5, 433	8, 066	92, 175
1930–31	11, 934	18, 646	12, 716	6, 105	3, 266	2, 713	1, 290	137	1, 397	3, 531	6, 494	8, 136	76, 365
1931–32[1]	12, 731	8, 911	8, 397	11, 873	9, 519	7, 896	4, 072	4, 650	5, 749	9, 351	7, 284	6, 088	96, 521

WHEAT, INCLUDING FLOUR

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1922–23	19, 308	39, 198	32, 099	25, 379	17, 890	16, 728	12, 751	12, 473	11, 011	10, 428	14, 593	13, 042	224, 900
1923–24	12, 999	20, 183	22, 779	19, 071	12, 503	13, 358	12, 486	10, 326	9, 659	8, 624	7, 401	10, 491	159, 880
1924–25	7, 758	21, 205	39, 537	53, 834	35, 425	24, 610	13, 126	11, 784	16, 480	12, 912	13, 114	10, 922	260, 803
1925–26	8, 944	12, 007	13, 152	9, 113	8, 794	8, 437	5, 687	4, 742	7, 039	6, 452	12, 558	11, 210	108, 035
1926–27	19, 819	35, 479	31, 031	24, 098	20, 655	15, 301	12, 821	8, 997	9, 183	16, 138	14, 123	11, 515	219, 160
1927–28	12, 100	28, 361	39, 792	36, 347	27, 003	12, 197	11, 809	6, 725	7, 492	7, 410	8, 793	8, 230	206, 259
1928–29	7, 193	14, 754	22, 772	28, 567	16, 195	12, 053	9, 833	8, 948	9, 090	9, 151	16, 128	9, 003	163, 687
1929–30	13, 784	17, 338	18, 568	14, 922	15, 155	12, 428	14, 073	9, 535	7, 321	7, 438	10, 208	12, 475	153, 245
1930–31	16, 377	24, 413	19, 352	12, 355	8, 701	6, 906	5, 731	3, 717	4, 757	7, 107	10, 203	11, 856	131, 475
1931–32[1]	17, 454	11, 919	11, 729	15, 563	13, 550	12, 100	8, 134	7, 995	8, 554	11, 882	8, 831	8, 088	135, 797

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States. The following factor has been used for converting flour into terms of wheat: 1 barrel of flour = the product of 4.7 bushels of grain.

[1] Preliminary.

TABLE 15.—*Wheat, all: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1923–24	89. 6	86. 4	91. 0	94. 2	93. 7	94. 5	96. 7	98. 0	98. 8	95. 8	96. 8	98. 5	92. 4
1924–25	105. 8	116. 8	114. 2	129. 7	133. 6	141. 1	162. 1	169. 8	164. 0	140. 5	149. 1	152. 7	127. 8
1925–26	140. 3	150. 4	144. 4	136. 4	148. 8	153. 7	158. 1	155. 5	146. 0	142. 2	142. 1	138. 9	145. 9
1926–27	127. 7	125. 1	117. 7	121. 4	123. 6	122. 8	122. 2	122. 8	120. 9	117. 2	123. 2	130. 1	123. 8
1927–28	127. 3	123. 5	119. 2	113. 7	111. 4	113. 9	115. 2	116. 2	121. 6	129. 2	144. 3	132. 0	120. 5
1928–29	118. 1	95. 2	94. 4	98. 7	97. 1	98. 2	98. 5	104. 2	104. 7	99. 8	90. 1	86. 8	100. 1
1929–30	102. 4	110. 7	112. 1	111. 5	103. 4	108. 1	107. 5	101. 3	91. 9	93. 4	87. 5	87. 9	105. 1
1930–31	70. 6	74. 0	70. 3	65. 6	60. 0	61. 3	59. 1	58. 7	58. 3	59. 2	59. 9	51. 9	66. 4
1931–32	36. 3	35. 4	35. 7	36. 1	50. 5	44. 1	44. 1	44. 0	44. 2	43. 1	42. 4	37. 3	38. 5
1932–33	35. 6	38. 5	37. 4	34. 6	32. 8	31. 6	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1922–December, 1923.

TABLE 16.—*Wheat, including flour: Supply, distribution, and disappearance in continental United States, 1919–20 to 1932–33*

Crop year beginning July	Supply: Stocks July 1: On farms [1]	Supply: Stocks July 1: In country elevators and mills [1]	Supply: Stocks July 1: Commercial stocks [2]	Supply: Stocks July 1: In merchant mills and elevators and stored for others [3]	Supply: Stocks July 1: In transit to merchant mills [3]	Supply: Stocks July 1: Total wheat as grain	Supply: Stocks July 1: Flour in terms of wheat [4]	Supply: New crop [1]	Supply: Imports (flour included) (5)	Supply: Total supply
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1919–20	18, 756	19, 672	10, 873			49, 301	7, 402	952, 097	5, 511	1, 014, 311
1920–21	48, 677	37, 304	23, 404			109, 385	10, 502	843, 309	57, 682	1, 020, 878
1921–22	57, 063	27, 167	9, 966			94, 196	6, 947	818, 964	17, 375	937, 482
1922–23	32, 519	28, 756	20, 342			81, 617	7, 793	846, 673	20, 031	956, 114
1923–24	35, 239	37, 117	29, 403			101, 759	10, 495	759, 506	28, 079	899, 839
1924–25	29, 349	36, 626	38, 597			104, 572	9, 616	840, 091	6, 201	960, 480
1925–26	28, 638	25, 287	29, 285	22, 576	9, 000	114, 786	8, 530	668, 982	15, 679	807, 977
1926–27	20, 570	29, 501	16, 480	24, 505	7, 350	98, 412	9, 757	833, 544	13, 264	954, 977
1927–28	26, 717	21, 776	21, 052	37, 038	11, 274	117, 857	9, 076	874, 633	15, 734	1, 017, 300
1928–29	23, 431	19, 277	38, 587	31, 920	10, 893	124, 108	9, 019	926, 130	21, 442	1, 080, 699
1929–30	45, 829	41, 546	90, 442	48, 279	16, 237	242, 333	13, 541	812, 573	12, 956	1, 081, 403
1930–31	47, 417	60, 166	109, 327	59, 170	14, 706	290, 786	20, 497	857, 427	19, 059	1, 187, 769
1931–32	31, 865	30, 252	203, 967	40, 221	12, 198	318, 503	6, 886	900, 219	12, 880	1, 238, 494
1932–33	71, 925	41, 817	168, 405	70, 582	9, 929	362, 658	7, 041	726, 831		

Crop year beginning July	Distribution: Exports and shipments: Exports (wheat only) [5]	Distribution: Exports and shipments: Exports flour as wheat [5]	Distribution: Exports and shipments: Re-exports and shipments (flour included) to Alaska Hawaii, and Puerto Rico [5]	Distribution: Exports and shipments: Total	Distribution: Seed requirements [6]	Distribution: Disappearance for food, feed, and loss	Distribution: Carry-over (including flour) June 30 [7]	Distribution: Population January 1 [8]	Distribution: Per capita disappearance: Wheat for food, feed, and loss	Distribution: Per capita disappearance: Flour in terms of wheat
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Thousands*	*Bushels*	*Bushels*
1919–20	122, 431	99, 599	3, 130	225, 160	90, 172	579, 092	119, 887	105, 711	5. 48	4. 68
1920–21	293, 268	76, 045	3, 690	373, 003	88, 408	458, 324	101, 143	107, 375	4. 27	
1921–22	208, 321	74, 245	3, 087	285, 653	88, 322	474, 097	89, 410	109, 040	4. 35	4. 17
1922–23	154, 951	69, 949	3, 117	228, 017	84, 433	531, 410	112, 254	110, 705	4. 80	
1923–24	78, 793	81, 087	3, 064	162, 944	73, 514	549, 193	114, 188	112, 370	4. 89	4. 25
1924–25	195, 490	65, 313	2, 964	263, 767	80, 951	492, 446	123, 316	114, 035	4. 32	4. 29
1925–26	63, 189	44, 846	3, 054	111, 089	79, 535	509, 184	108, 169	115, 700	4. 40	4. 31
1926–27	156, 250	62, 910	3, 180	222, 340	85, 065	520, 639	126, 933	117, 364	4. 44	4. 33
1927–28	145, 999	60, 260	2, 743	209, 002	92, 693	582, 478	133, 127	119, 029	4. 89	4. 26
1928–29	103, 114	60, 573	3, 227	166, 914	85, 375	572, 536	255, 874	120, 694	4. 74	4. 29
1929–30	92, 175	61, 070	3, 049	156, 294	84, 882	541, 444	298, 783	122, 359	4. 43	4. 13
1930–31	76, 216	55, 259	2, 870	134, 345	81, 955	646, 080	325, 389	123, 630	5. 23	
1931–32	96, 521	39, 276	3, 621	139, 418	80, 785	648, 592	369, 699	124, 511	5. 21	

Bureau of Agricultural Economics.

[1] Based on returns to the bureau from crop reporters.
[2] From Bradstreets, 1919–20 to 1926–27; Bureau of Agricultural Economics, 1927–28 to end of table.
[3] Bureau of the Census, raised to represent all merchant mills. Stocks stored for others included, beginning July, 1930.
[4] From Chicago Daily Trade Bulletin.
[5] From Reports of Foreign and Domestic Commerce of the United States.
[6] Amount of seed used per acre from returns to the bureau from inquiries sent to crop reporters.
[7] For individual items see supply section.
[8] Bureau of the Census.

TABLE 17.—*Wheat, including flour, in terms of grain: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Canada	307, 640	796	422, 732	1, 331	184, 213	1, 392	267, 365	243	190, 563	232
United States	170, 077	15, 815	163, 687	21, 442	153, 245	12, 956	131, 475	19, 059	135, 797	12, 896
Argentina	159, 377	[3] 10	227, 059	-------	161, 265	-------	120, 638	-------	144, 920	-------
Australia	83, 268	3	107, 785	4	61, 776	3	143, 296	2	155, 593	-------
Hungary	23, 539	8	23, 658	1	31, 415	3	18, 425	3	18, 064	1
Russia	[3] 20, 319	0	124	0	7, 380	0	111, 780	253	71, 830	2, 093
Yugoslavia	10, 822	5	7, 919	27	23, 593	3	5, 332	8	15, 369	-------
British India	10, 080	8, 636	5, 716	27, 549	6, 798	8, 646	10, 197	10, 618	2, 913	1, 201
Rumania	6, 528	79	[4] 1, 582	[4] 0	[4] 2, 560	[4] 66	16, 072	15	[4] 37, 518	[4] 11
Algeria	5, 162	[3] 2, 104	5, 904	2, 080	5, 358	1, 037	10, 125	986	7, 039	-------
Tunis	3, 518	669	5, 431	285	6, 120	164	6, 286	909	8, 366	678
Bulgaria	1, 869	[5] 1, 804	760	-------	66	1, 804	5, 041	0	11, 795	-------
Chile	925	456	757	116	1, 063	54	1, 193	10	47	4
Total	803, 124	30, 385	973, 114	52, 835	644, 882	26, 128	847, 225	32, 106	808, 813	17, 106
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	11, 369	215, 665	11, 158	215, 138	10, 795	212, 698	10, 064	230, 449	12, 294	257, 405
Germany	11, 527	85, 668	17, 664	86, 162	7, 203	67, 958	825	30, 853	12, 329	34, 290
Italy	2, 014	76, 212	2, 184	91, 930	3, 273	46, 700	2, 652	86, 231	4, 906	38, 372
France	4, 170	46, 574	116	50, 665	18, 055	38, 471	22, 145	66, 929	11, 995	93, 311
Belgium	2, 452	43, 482	2, 542	44, 061	1, 953	44, 543	3, 102	48, 261	6, 733	54, 317
Brazil	0	32, 839	0	36, 244	0	33, 889	0	30, 708	0	31, 595
Netherlands	943	30, 050	709	29, 518	856	30, 992	1, 428	36, 830	366	31, 431
China [6]	1, 862	23, 486	4, 265	20, 328	1, 865	49, 123	59	22, 020	93	65, 575
Japan	5, 989	23, 158	10, 768	28, 203	5, 403	19, 156	7, 953	25, 343	7, 592	29, 977
Greece	0	20, 055	0	22, 144	0	21, 521	0	24, 081	0	23, 940
Czechoslovakia	418	18, 604	56	17, 248	1, 694	13, 980	4, 007	17, 063	3, 365	23, 860
Irish Free State	[3] 74	18, 502	110	17, 853	-------	17, 915	-------	19, 007	-------	19, 902
Switzerland	0	16, 461	0	15, 496	1	16, 915	4	18, 393	27	21, 129
Austria	116	16, 275	59	14, 903	132	18, 530	267	17, 030	114	14, 200
Egypt	162	10, 448	181	12, 906	108	11, 202	24	9, 699	4	7, 672
Denmark	524	10, 102	110	17, 149	310	8, 080	130	11, 540	48	17, 392
Sweden	2, 004	9, 092	3, 076	10, 553	2, 147	9, 309	76	5, 483	14	6, 606
Norway	-------	6, 964	-------	8, 538	-------	7, 130	-------	8, 275	-------	8, 793
Union of South Africa	253	6, 317	261	8, 148	326	5, 036	173	3, 631	291	2, 096
Cuba	0	[2] 5, 685	0	5, 531	0	5, 498	0	-------	0	-------
Finland	0	5, 390	0	6, 095	0	5, 623	0	4, 878	0	4, 197
Spain	526	5, 189	366	17, 244	188	4, 959	169	13	55	2, 539
Poland	1, 407	4, 820	106	3, 865	790	602	4, 286	296	3, 761	585
Syria and Lebanon [4]	[2] 14	2, 710	7	5, 358	22	1, 304	290	458	1, 050	1, 369
Latvia [4]	17	2, 027	0	2, 861	86	2, 524	176	1, 966	0	790
New Zealand	45	1, 658	4	792	217	719	1	752	1	701
Indo-China [4]	0	1, 177	0	1, 206	0	1, 202	0	981	0	891
Estonia	0	1, 062	0	1, 176	0	1, 218	0	880	0	520
Total	45, 886	739, 672	53, 742	791, 315	55, 424	696, 797	57, 831	722, 040	65, 038	793, 455

Bureau of Agricultural Economics, official sources except where otherwise noted.

[1] Preliminary.
[2] 3-year average.
[3] 4-year average.
[4] Monthly Crop Report and Agricultural Statistics.
[5] One year only.
[6] Calendar year

TABLE 18.—*Wheat: Weighted average price*[1] *per bushel of reported cash sales at Minneapolis, St. Louis, Kansas City, and 6 markets combined, 1923–24 to 1932–33*

Grade, market, and crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted average
No. 1 Northern spring, Minneapolis:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	112	118	121	120	114	116	119	121	121	121	122	125	117
1924–25	137	131	130	146	148	106	189	187	171	150	167	164	156
1925–26	159	164	150	149	155	169	173	167	161	164	162	163	161
1926–27	172	149	143	149	146	146	143	142	139	138	147	149	146
1927–28	147	143	134	129	130	132	135	134	139	153	157	148	136
1928–29	138	119	119	116	116	115	121	128	125	120	111	115	118
1929–30	143	135	135	131	128	131	127	125	112	111	107	100	133
1930–31	92	91	87	82	75	77	76	75	76	79	81	74	83
1931–32	61	65	69	71	80	73	75	75	70	71	68	60	66
1932–33	57	58	58	54	49	48	------	------	------	------	------	------	------
No. 2 Red Winter, St. Louis:													
1923–24	97	99	109	116	112	114	116	118	114	113	112	116	107
1924–25	135	138	140	156	103	179	210	202	186	177	186	189	159
1925–26	159	172	171	170	171	184	194	185	170	171	162	147	169
1926–27	142	134	136	140	136	137	138	135	130	129	142	150	138
1927–28	141	142	142	145	141	144	151	156	169	196	196	179	149
1928–29	147	138	145	144	145	139	142	140	136	125	117	121	139
1929–30	139	132	135	132	129	135	134	123	118	117	114	105	130
1930–31	85	89	88	87	83	83	78	79	78	80	79	72	83
1931–32	48	47	47	52	62	57	57	57	55	57	56	49	52
1932–33	47	53	54	50	47	46	------	------	------	------	------	------	------
No. 2 Amber Durum, Minneapolis:													
1923–24	96	96	99	104	103	104	113	115	118	114	115	118	106
1924–25	127	129	129	161	164	176	215	210	202	176	180	162	156
1925–26	164	150	130	129	143	156	157	151	144	149	147	150	144
1926–27	154	153	138	150	161	174	168	160	157	154	158	157	155
1927–28	153	140	128	123	128	133	130	129	133	141	140	131	132
1928–29	123	108	106	112	114	110	127	129	124	118	108	115	113
1929–30	135	127	128	125	119	123	119	111	97	99	97	88	119
1930–31	87	86	79	78	70	74	72	73	72	73	77	64	78
1931–32	61	73	73	79	87	84	87	86	78	72	67	56	76
1932–33	54	57	53	51	50	50	------	------	------	------	------	------	------
No. 2 Hard Winter Kansas City:													
1923–24	96	101	109	112	109	109	113	111	109	104	106	108	105
1924–25	120	119	120	137	143	162	182	181	171	151	163	160	135
1925–26	154	164	158	158	163	172	178	171	161	159	155	153	163
1926–27	137	131	132	139	137	138	137	135	133	131	142	144	135
1927–28	136	135	131	128	131	132	133	133	138	152	160	147	135
1928–29	120	106	107	110	112	111	114	118	116	110	101	105	112
1929–30	125	123	124	122	119	121	119	113	102	101	99	89	120
1930–31	80	81	78	74	09	71	69	69	70	73	73	68	76
1931–32	44	43	43	48	59	52	53	54	51	53	54	46	47
1932–33	45	48	48	45	43	42	------	------	------	------	------	------	------
6 markets, all classes and grades:[2]													
1923–24	99.0	101.8	106.8	110.4	105.7	105.0	110.3	111.8	111.6	109.9	110.5	116.6	107.0
1924–25	125.7	123.5	128.3	144.8	148.2	163.6	188.8	184.8	172.1	150.8	165.5	161.6	145.3
1925–26	155.7	160.5	144.8	143.3	153.5	165.7	170.3	164.8	154.9	156.0	153.8	151.6	155.0
1926–27	141.6	135.3	135.6	139.4	137.7	139.5	138.8	136.2	133.6	134.7	145.1	148.6	138.3
1927–28	138.7	136.4	128.7	125.1	125.6	128.0	131.0	132.0	136.6	150.7	151.4	141.8	132.9
1928–29	126.0	109.4	108.9	107.6	109.1	107.4	113.7	118.1	114.2	109.2	101.1	105.3	110.6
1929–30	129.8	125.7	127.4	123.7	121.2	123.5	121.6	115.8	103.9	102.5	100.9	94.1	121.9
1930–31	82.6	84.7	79.0	76.0	69.8	72.5	71.4	70.9	71.4	74.5	75.5	66.8	77.1
1931–32	46.5	50.6	55.7	58.4	68.7	60.0	61.3	59.0	57.8	60.1	60.8	52.8	55.1
1932–33	47.6	55.1	55.1	51.2	48.8	46.1	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record, St. Louis Daily Market Reporter and Kansas City Grain Market Review.

[1] Average of daily prices weighted by car-lot sales.
[2] Compiled from daily trade papers of markets named. The markets are Chicago, Minneapolis, Kansas City, St. Louis, Omaha, and Duluth. The prices in this section of the table are comparable with prices paid to producers, in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

TABLE 19.—*Wheat: Average price per bushel of specified grades at markets named, 1890–91 to 1931–32*

Crop year, beginning July—	No. 1 Northern Spring at Minneapolis [1]	No. 2 Amber Durum at Minneapolis	No. 2 Hard Winter at Chicago [2]	No. 2 Hard Winter at Kansas City	No. 2 Red Winter at St. Louis	No. 2 Hard Winter at New York [3]	Imported red at Liverpool [4]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1890-91	95		97			113	111
1891-92	86		89			103	115
1892-93	67		73			83	86
1893-94	59		60			70	75
1894-95	60		57			69	68
1895-96	58		61			70	78
1896-97	69		70			70	88
1897-98	98		91			107	116
1898-99	70		71			80	86
1899-1900	67		68	65	72	78	56
1900-01	75		72	67	74	84	87
1901-02	72		71	68	72	82	87
1902-03	74		73	68	71	85	80
1903-04	89	69	81	77	87	98	90
1904-05	113	92	101	97	103	120	[5] 95
1905-06	84	70	86	80	90	96	[6] 98
1906-07	83	64	70	72	76	92	93
1907-08	107	85	96	93	94	116	110
1908-09	111	95	100	99	104	122	120
1909-10	109	90	109	107	113	120	120
1910-11	105	87	100	98	99	104	107
1911-12	107	98	94	97	94	110	112
1912-13	87	85	94	88	105	103	114
1913-14	88	83	89	84	89	99	106
1914-15	120	122	111	105	110	136	157
1915-16	109	104	114	119	120	128	175
1916-17	176	180	157	71	163	208	224
1917-18	220	218	228	252	223	240	235
1918-19	225	222	234	219	223	237	240
1919-20	272	249	227	242	230	255	215
1920-21	207	200	216	183	213	210	223
1921-22	143	119	128	120	127	135	151
1922-23	120	107	113	113	121	131	144
1923-24	117	106	106	105	107	121	[7] 127
1924-25	156	156	139	135	159	170	181
1925-26	161	144	161	163	169	180	176
1926-27	146	155	140	135	138	156	163
1927-28	136	132	138	135	149	153	152
1928-29	118	113	117	112	139	131	128
1929-30	133	119	130	120	130	126	129
1930-31	83	78	84	76	83	[5] 92	80
1931-32	68	76	63	47	52	68	59

Bureau of Agricultural Economics. The prices at Chicago, Minneapolis, Kansas City, and St. Louis are weighted averages beginning 1899–1900. New York and Liverpool are simple averages throughout. The weighted average prices are compiled from daily trade papers of markets named.

[1] Simple average of the monthly high and low, 1890–91 to 1898–99.

[2] 1890–91 to 1898–99, simple averages of daily high and low for No. 1 Northern Spring. Average price No. 1 Northern Spring for 1899–1900 was 70 cents per bushel.

[3] *1890–91 to 1908–09, averages of monthly high and low, from Annual Statistical Report, New York* Produce Exchange, of No. 1 Northern Spring; 1909–10 to 1931–32, averages of daily cash closing prices, from New York Journal of Commerce.

[4] Compiled from Broomhall's Yearbooks and Corn Trade News. 1890–91 to 1925–26, imported red; 1926–27 to 1931–32, average of all parcels at Liverpool.

[5] Average for 6 months. [6] Average for 10 months. [7] Average for 11 months.

TABLE 20.—*Wheat, No. 3 Manitoba Northern: Average cash price per bushel at Winnipeg, in terms of United States money, 1923–24 to 1932–33* [1]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923-24	99	103	96	89	87	83	86	90	88	89	92	105	92
1924-25	126	184	156	150	163	161	184	187	167	149	174	162	157
1925-26	163	160	132	120	136	149	146	144	138	146	144	144	143
1926-27	149	138	133	136	131	123	123	127	130	133	146	149	135
1927-28	153	145	131	127	124	124	123	124	131	141	142	130	133
1928-29	120	106	106	111	111	109	112	120	119	115	107	112	113
1929-30	152	152	144	134	126	130	123	110	100	103	104	98	123
1930-31	90	88	74	68	60	48	47	53	50	54	53	53	62
1931-32	49	46	43	45	52	43	44	48	49	50	49	43	47
1932-33	43	46	43	41	38	32							

Bureau of Agricultural Economics. Compiled as follows: July, 1921–July, 1928, Reports on the Grain Trade of Canada; August, 1928, to latest date shown, Minneapolis Daily Market Record. Conversions at current rate of exchange July, 1921–March, 1925, and September, 1931, to end of table; par rate used April, 1925–August, 1931. Rates are monthly averages as reported by the Federal Reserve Board.

[1] Average of daily cash closing prices, basis, in store at Fort William and Port Arthur.

TABLE 21.—*Wheat: Average spot price per bushel of parcels of imported wheat at Liverpool, 1923–24 to 1932–33*

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	123	120	119	121	119	117	120	124	120	120	121	125	121
1924–25	141	153	155	174	176	183	200	205	192	170	184	181	176
1925–26	169	173	160	149	165	185	181	175	161	171	173	169	169
1926–27	167	162	160	171	171	163	160	157	155	156	165	165	163
1927–28	161	160	151	149	147	148	149	146	151	159	155	147	152
1928–29	141	126	126	129	129	126	131	135	131	125	116	117	128
1929–30	141	142	137	136	125	141	140	124	119	120	114	110	129
1930–31	106	105	92	86	81	74	68	70	67	71	72	67	80
1931–32	62	53	63	59	64	57	55	60	63	64	61	55	59
1932–33	54	57	59	55	52	40	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Parcels are less than cargo lots. Prices are per bushel of 60 pounds. Compiled from Broomhall's Corn Trade News. These are simple averages of daily sales prices of parcels at Liverpool. Conversions at par from January, 1926, to August, 1931, inclusive. Prior to January, 1926, and beginning with September, 1931, conversions were made at monthly average of current rates of exchange as given in Federal Reserve Bulletins.

TABLE 22.—*Flour, spring wheat, family patents: Average wholesale price per barrel,*[1] *Minneapolis, 1923–24 to 1932–33*

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	6.21	6.37	6.45	6.43	6.21	6.30	6.44	6.51	6.49	6.56	6.83	7.12	6.49
1924–25	*7.72*	*7.69*	*7.52*	*8.19*	*8.22*	*9.03*	*9.80*	*10.02*	*9.34*	*8.54*	*9.12*	*8.86*	*8.67*
1925–26	8.78	9.04	8.52	8.52	8.81	9.52	9.85	9.46	9.19	9.20	9.00	9.32	9.10
1926–27	9.27	8.50	7.87	8.08	7.85	8.02	7.95	7.85	7.74	7.75	8.23	8.39	8.13
1927–28	8.26	7.98	7.52	7.43	7.38	7.37	7.48	7.47	7.88	8.48	8.68	8.12	7.84
1928–29	7.63	6.94	6.87	6.76	6.68	6.68	7.00	7.40	7.23	7.07	6.60	6.68	6.96
1929–30	8.38	7.96	7.79	7.38	7.29	7.54	7.29	6.91	6.71	6.67	6.43	6.31	7.22
1930–31	6.01	5.92	5.54	5.42	5.24	5.34	5.37	5.22	5.07	4.94	5.17	5.08	5.36
1931–32	4.56	4.50	4.44	4.52	5.01	4.75	4.50	4.42	4.31	4.62	4.71	4.38	4.56
1932–33	4.24	4.43	4.44	4.19	4.02	4.07	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record. Prices 1909–10 to 1922–23 appear in 1930 Yearbook, Table 25.

[1] Packed in 98-pound cotton sacks, and sold in carload lots.

TABLE 23.—*Bread: Average retail price per pound (baked weight) in leading cities of the United States, 1923–24 to 1932–33*

Year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	8.8	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
1924–25	8.7	8.8	8.8	8.8	8.9	8.9	9.2	9.5	9.4	9.4	9.4	9.4	9.1
1925–26	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
1926–27	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.3	9.4
1927–28	9.3	9.3	9.3	9.3	9.3	9.2	9.2	9.2	9.1	9.1	9.1	9.2	9.2
1928–29	9.2	9.2	9.1	9.1	9.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.1
1929–30	9.0	9.0	9.0	8.9	8.9	8.9	8.9	8.8	8.8	8.8	8.8	8.8	8.9
1930–31	8.8	8.7	8.7	8.6	8.5	8.5	8.2	8.0	7.9	7.7	7.7	7.6	8.2
1931–32	7.5	7.4	7.3	7.3	7.3	7.2	7.1	7.0	7.0	6.9	6.9	6.9	7.2
1932–33	6.8	6.8	6.7	6.7	6.7	6.6	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics retail prices, monthly. Data for 1913–14 to 1922–23 are available in the 1930 Yearbook, p. 615, Table 26.

TABLE 24.—*Bran, standard: Average price per ton, Minneapolis, 1923–24 to 1932–33* [1]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	19.84	23.62	27.79	28.07	25.65	24.77	24.98	23.66	22.00	20.84	17.66	19.12	23.17
1924–25	22.77	23.43	23.00	24.66	25.62	30.43	30.14	24.49	23.45	23.46	26.84	26.34	25.34
1925–26	23.58	24.20	23.09	22.83	25.73	26.34	26.17	23.68	22.24	25.05	23.30	21.31	23.96
1926–27	22.02	21.69	21.64	21.33	23.14	26.02	26.48	27.64	26.96	27.31	28.43	20.51	24.93
1927–28	25.13	26.85	25.88	25.96	28.41	30.00	30.66	32.47	35.68	34.28	35.03	29.68	30.01
1928–29	27.29	24.12	25.49	28.00	30.82	31.69	30.54	28.64	26.88	22.93	22.38	22.56	26.79
1929–30	20.17	26.44	29.19	28.21	27.00	27.66	26.58	24.45	23.17	27.43	25.06	21.25	26.13
1930–31	19.33	24.17	21.43	19.91	17.97	16.57	15.61	14.66	17.87	19.02	14.15	11.38	17.67
1931–32	10.30	10.55	10.02	9.93	14.17	13.04	12.99	11.65	13.35	13.63	10.74	9.45	11.65
1932–33	8.56	8.58	8.44	7.93	8.33	8.15	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record. Prices are simple averages of daily quotations.

[1] Quoted as follows: Prior to Sept. 3, 1921, quoted as "car lots per ton, in 100-pound sacks"; Sept. 3, 1921–May 31, 1930, no container nor lots designated; June 2–Oct. 31, 1930, "based on car lots per ton"; beginning Nov. 1, 1930, "car lots, f. o. b. Minneapolis, prompt shipment."

TABLE 25.—*Middlings, standard: Average price per ton, Minneapolis, 1923–24 to 1932–33* [1]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	24.83	25.89	27.85	27.78	25.13	23.80	25.43	23.95	21.65	20.96	18.00	19.92	23.78
1924–25	24.46	25.68	25.27	26.64	27.99	31.44	33.08	26.09	23.62	24.28	29.07	29.68	27.28
1925–26	25.53	26.95	26.37	24.19	26.31	25.28	26.10	23.71	22.03	24.20	21.77	21.60	24.50
1926–27	22.96	23.01	22.67	22.31	24.16	27.38	27.35	28.61	28.46	27.79	29.13	29.10	26.08
1927–28	31.42	34.46	29.22	26.88	28.72	30.00	30.52	32.71	35.85	34.33	37.14	35.30	32.21
1928–29	32.18	24.31	27.44	28.61	31.01	31.21	30.46	28.31	26.28	22.76	21.98	22.64	27.27
1929–30	28.42	29.25	32.66	32.08	28.76	28.00	28.46	24.11	22.71	26.74	25.21	22.00	27.21
1930–31	20.64	25.10	22.17	19.55	17.49	16.00	14.85	13.52	17.36	18.52	13.85	11.95	17.58
1931–32	11.06	10.35	10.35	10.02	14.40	13.03	12.12	11.01	12.42	13.52	10.72	9.13	11.51
1932–33	9.57	9.52	8.50	8.08	8.37	7.62	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record. Prices are simple averages of daily quotations.

[1] Quoted as follows: Prior to Sept. 3, 1921, quoted as "car lots per ton, in 100-pound sacks"; Sept. 3, 1921–May 31, 1930, no container nor lots designated; June 2–Oct. 31, 1930, "based on car lots per ton"; beginning Nov. 1, 1930, "car lots, f. o. b. Minneapolis, prompt shipment."

TABLE 26.—*Wheat: Volume of trading in futures in all contract markets, by months, 1924–25 to 1932–33*

Month	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32	1932–33
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
July	1,333	1,460	1,438	1,018	996	2,889	1,306	677	592
August	1,300	1,561	1,226	1,144	1,133	2,265	1,531	647	1,214
September	1,068	1,475	1,156	923	818	1,401	1,216	519	831
October	1,596	1,573	1,090	918	916	1,738	1,160	925	714
November	1,340	1,500	1,227	838	750	1,805	1,094	1,479	725
December	1,628	2,349	972	543	517	1,608	529	804	488
January	1,908	1,456	704	384	1,085	1,334	847	654	------
February	1,781	1,284	581	508	892	1,484	369	770	------
March	2,273	1,864	920	923	1,083	1,201	433	859	------
April	1,482	1,397	846	1,590	1,361	1,501	706	1,127	------
May	1,508	1,222	1,260	1,471	1,253	1,004	635	787	------
June	1,759	1,204	1,164	941	1,391	1,377	737	840	------
Total	18,876	18,345	12,584	11,201	12,195	19,607	10,063	10,147	------

Grain Futures Administration.

TABLE 27.—*Wheat: Volume of trading in futures at contract markets, by markets and by crop years for period 1927–28 to 1931–32, and monthly for period July 1, 1931–December 31, 1932*

Year and month	Chicago Board of Trade	Chicago Open Board	Minneapolis	Kansas City	Duluth	St. Louis	Milwaukee	Seattle	Portland	New York	Omaha	Hutchinson
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1927-28	9,203	342	824	441	272	53	28	7	------	29	------	------
1928-29	9,908	387	887	576	377	28	25	8	⅓	------	------	------
1929-30	16,599	460	1,248	875	328	22	39	14	15	------	(1)	------
1930-31	8,360	297	581	515	220	9	15	12	13	25	15	------
1931-32	8,566	334	364	773	67	15	18	5	3	1	⅛	1
1931												
July	543	19	27	79	5	¾	1	¾	¼	¼	(2)	(3)
August	501	22	39	72	9	¾	1	½	¼	¼	(2)	------
September	405	18	39	47	9	¼	¾	¾	⅛	⅛	(2)	------
October	779	30	36	66	10	1	2	¾	¼	(2)	(2)	------
November	1,272	35	48	107	10	2	3	¾	¾	------	(2)	------
December	743	30	30	53	5	2	2	¼	⅛	¼	------	------
1932												
January	569	24	20	37	2	1	1	¼	(2)	------	(2)	------
February	669	27	19	49	3	1	1	½	¼	(2)	(2)	------
March	734	32	27	60	3	2	1	⅛	⅛	(2)	------	------
April	970	36	31	81	4	2	2	½	½	(2)	(2)	------
May	669	29	23	60	3	1	1	⅛	⅛	------	------	¾
June	711	32	27	64	3	1	1	¼	⅛	------	------	½
July	482	18	30	56	3	½	¾	½	⅛	------	------	¼
August	1,018	27	66	82	16	1	2	¾	½	------	------	¼
September	693	20	53	50	12	1	1	½	⅛	------	------	⅛
October	579	21	44	59	9	¾	1	¼	⅛	------	------	------
November	583	19	48	60	12	¾	1	¾	¼	------	------	¼
December	401	17	31	32	5	½	¾	¼	⅛	------	------	⅛

Grain Futures Administration.

[1] Trading on Omaha Grain Exchange started June 16, 1930.
[2] Less than 100,000 bushels.
[3] Trading on Hutchinson Board of Trade Association began May 16, 1932.

TABLE 28.—*Wheat: Amount of open commitments in the various futures on the Chicago Board of Trade, semimonthly, June 30, 1931–December 31, 1932*

Period ended—	Future					
	July	September	December	March	May	All futures
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1931						
June 30	18	40	21	------	------	79
July 15	14	43	31	------	------	88
July 31	------	43	43	------	------	86
Aug. 15	------	36	44	------	15	95
Aug. 31	------	14	48	1	34	96
Sept. 15	------	5	46	1	43	95
Sept. 30	------	------	44	1	49	94
Oct. 15	2	------	38	2	56	98
Oct. 31	8	------	33	2	78	121
Nov. 16	10	------	21	2	94	127
Nov. 30	14	------	9	3	98	123
Dec. 15	18	------	4	2	93	118
Dec. 31	21	------	------	2	92	115
1932						
Jan. 15	23	2	------	2	89	116
Jan. 30	25	4	------	3	81	113
Feb. 15	29	8	------	3	77	117
Feb. 29	34	13	------	2	77	126
Mar. 15	39	18	------	------	73	130
Mar. 31	42	23	------	------	61	126
Apr. 15	50	29	------	------	41	120
Apr. 30	59	39	4	------	12	114
May 16	57	42	8	------	3	110
May 31	52	47	13	------	------	112
June 15	40	53	19	------	------	112
June 30	13	63	30	------	------	106
July 15	1	68	42	------	------	111

TABLE 28.—*Wheat: Amount of open commitments in the various futures on the Chicago Board of Trade, semimonthly, June 30, 1931–December 31, 1932*—Con.

Period ended—	Future: July	September	December	March	May	All futures
1932	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
July 30		62	59			121
Aug. 15		40	85		14	139
Aug. 31		10	110		37	157
Sept. 15		2	112		48	162
Sept. 30			113		58	171
Oct. 15	2		98		65	165
Oct. 31	6		76		73	155
Nov. 15	12		62		81	155
Nov. 30	27		14		98	139
Dec. 15	33		4		102	139
Dec. 31	34				99	133

Grain Futures Administration.

TABLE 29.—*Rye: Acreage, production, value, exports, etc., United States, 1909–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Price per bushel of No. 2 rye at Minneapolis year beginning July [1]	Foreign trade, including flour, year beginning July [2]: Domestic exports	Imports	Net exports [3]: Total	Percentage of production
	1,000 acres	*Bushels of 56 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1909	*2,196*	*13.4*	*29,520*							
1909	2,196	16.1	35,406	72.2	25,548	70	242	30	212	0.6
1910	2,185	16.0	34,897	71.5	24,953	77	40	227	[4] 187	.5
1911	2,127	15.6	33,119	83.2	27,557	86	31	134	[4] 103	.3
1912	2,117	16.8	35,664	60.3	23,636	60	1,855	1	1,854	5.2
1913	2,557	16.2	41,381	63.4	26,220	58	2,273	37	2,236	5.4
1914	2,541	16.8	42,779	86.5	37,018	98	13,027	147	12,880	30.1
1915	3,129	17.3	54,050	83.4	45,083	94	15,250	566	14,684	27.2
1916	3,213	15.2	48,862	122.1	59,676	135	13,703	428	13,275	27.2
1917	4,317	14.6	62,933	166.0	104,447	193	17,186	834	16,352	26.0
1918	6,391	14.2	91,041	151.6	138,038	158	36,467	638	35,829	39.4
1919	*7,679*	*9.9*	*75,992*							
1919	7,129	10.6	75,308	133.1	100,206	160	41,531	1,077	40,454	53.7
1920	4,799	13.0	62,342	125.6	78,329	161	47,337	452	46,885	75.2
1921	4,824	12.7	61,070	68.2	41,644	92	29,944	700	29,244	47.9
1922	6,757	15.5	104,700	67.6	70,777	75	51,663	99	51,564	49.2
1923	4,858	11.1	53,870	61.9	33,335	65	19,902	2	19,900	36.9
1924	*3,744*	*14.9*	*55,674*							
1924	3,868	14.9	57,672	106.3	61,282	114	50,242	1	50,241	87.1
1925	3,717	10.9	40,451	76.5	30,961	88	12,647		12,646	31.3
1926	3,350	9.8	32,884	81.9	26,937	98	21,698	1	21,697	66.0
1927	3,380	15.3	51,840	84.3	43,687	104	26,346	2	26,345	50.8
1928	3,232	11.6	37,556	84.4	31,687	95	9,488	1	9,487	25.3
1929	*3,033*	*11.3*	*34,309*							
1929	3,054	11.4	34,950	[5] 85.8	[6] 29,975	90	2,600	1	2,599	7.4
1930	3,543	12.8	45,481	[5] 44.2	[6] 20,088	51	227	88	139	.3
1931	3,060	10.5	32,026	[5] 33.7	[6] 10,805	42	909	1	908	2.8
1932 [7]	3,271	12.2	39,855	[5] 22.5	[6] 8,981					

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised 1919 to 1928. See introductory text; italic figures are census returns. See 1927 Yearbook, page 764, for data for earlier years.

[1] Prices are from Minneapolis Daily Market Record and are averages of daily prices weighted by car-lot sales.

[2] Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce. Rye—General imports, 1909; imports for consumption, 1910–1932. Rye flour—Imports for consumption, 1909–1932. Rye flour converted to rye on the basis that 1 barrel of rye flour is the product of 6 bushels of grain.

[3] Total exports (domestic plus foreign) minus total imports.

[4] Net imports.

[5] Weighted average price for crop marketing season.

[6] Based on weighted average price for crop marketing season.

[7] Preliminary.

TABLE 30.—*Rye: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932[1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
New York	29	20	18	14.2	17.0	15.5	407	340	279	51	43
New Jersey	37	21	22	16.4	17.0	17.0	624	357	374	51	46
Pennsylvania	103	135	124	13.6	15.0	12.5	1,392	2,025	1,550	48	43
North Atlantic	168	176	164	14.3	15.5	13.4	2,422	2,722	2,203	48.8	43.5
Ohio	42	74	44	12.7	18.0	13.0	556	1,332	572	35	30
Indiana	111	113	85	12.2	14.5	11.5	1,341	1,638	978	31	27
Illinois	60	64	45	15.2	15.5	12.5	873	992	562	32	27
Michigan	185	158	158	13.3	13.5	13.5	2,501	2,133	2,133	33	27
Wisconsin	250	175	236	12.4	12.5	12.0	3,065	2,188	2,832	39	31
Minnesota	465	365	310	15.8	15.0	16.0	7,076	5,475	4,960	29	21
Iowa	39	41	49	16.0	15.0	15.0	619	615	735	33	24
Missouri	16	28	15	9.3	12.0	7.5	147	336	112	40	37
North Dakota	1,333	770	1,040	11.3	6.0	11.0	16,277	4,620	11,440	22	15
South Dakota	169	352	475	12.8	7.0	15.0	2,049	2,464	7,125	24	15
Nebraska	210	333	283	11.2	9.0	10.0	2,448	2,997	2,830	27	20
Kansas	32	25	19	11.0	12.0	11.0	362	300	209	32	24
North Central	2,912	2,498	2,759	12.8	10.0	12.5	37,314	25,090	34,488	29.0	19.4
Delaware	4	7	7	13.4	17.5	12.5	54	122	88	52	42
Maryland	16	21	19	13.0	18.0	12.0	226	378	228	48	42
Virginia	34	70	53	10.4	16.3	10.0	377	1,141	530	54	49
West Virginia	12	16	15	10.5	16.2	8.5	126	259	128	54	48
North Carolina	58	64	64	7.0	9.0	8.0	442	576	512	69	61
South Carolina	8	8	9	8.1	9.5	8.0	71	76	72	96	71
Georgia	17	13	14	6.2	8.5	6.3	108	110	88	99	69
South Atlantic	148	199	181	8.9	13.4	9.1	1,405	2,662	1,646	59.3	53.3
Kentucky	16	24	13	11.2	15.0	9.0	200	360	117	46	43
Tennessee	16	22	19	6.8	8.0	6.0	117	176	114	63	55
Oklahoma	17	9	6	8.5	13.0	10.0	147	117	60	32	25
Texas	4	3	3	10.0	13.5	9.0	41	40	27	27	26
South Central	53	58	41	9.0	11.9	7.8	505	693	318	46.9	42.5
Montana	65	20	40	11.7	4.5	13.0	888	90	520	21	15
Idaho	3	3	4	12.6	10.0	12.0	41	30	48	51	26
Wyoming	45	25	24	8.2	6.0	6.0	353	150	144	35	25
Colorado	78	53	25	9.3	7.0	6.0	675	371	150	23	24
Utah	4	3	3	9.2	5.0	8.0	32	15	24	63	44
Washington	19	10	9	11.7	7.5	8.0	238	75	72	52	40
Oregon	14	15	21	13.1	8.5	11.5	206	128	242	55	44
Western	228	129	126	10.4	6.7	9.5	2,433	859	1,200	33.6	25.7
United States	3,509	3,060	3,271	12.5	10.5	12.2	44,081	32,026	39,855	33.7	22.5

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 31.—*Rye: World production, 1894–95 to 1932–33*

Crop year	World production, excluding Russia and China	Northern Hemisphere production, excluding Russia and China	European production, excluding Russia	Selected countries						
				Russia [1]	United States	Germany	France	Poland	Hungary	Czechoslovakia
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1894–95	713	712	668	863	30	328	75	......	58	......
1895–96	664	663	618	773	31	304	72	......	47	......
1896–97	716	714	673	790	29	336	70	......	51	......
1897–98	648	646	600	654	33	322	48	......	36	......
1898–99	726	725	678	738	33	356	67	......	46	......
1899–1900	710	708	664	912	30	342	67	......	50	......
1900–1	675	673	629	920	31	337	59	......	42	......
1901–2	690	688	644	755	31	321	58	......	44	......
1902–3	733	731	682	919	35	374	46	......	53	......
1903–4	767	765	720	912	32	390	58	......	51	......
1904–5	755	754	709	1,008	32	396	53	......	46	......
1905–6	782	781	732	737	35	378	59	......	53	......
1906–7	787	785	736	668	37	379	51	......	54	......
1907–8	751	749	700	815	35	384	56	......	42	......
1908–9	827	826	776	790	36	423	52	......	48	......
1909–10	872	870	821	904	35	447	56	......	47	......
1910–11	818	816	768	875	35	414	44	......	52	......
1911–12	828	826	779	769	33	428	47	......	54	......
1912–13	862	860	810	1,051	36	457	49	......	57	......
1913–14	892	889	834	1,011	41	481	50	......	56	......
1914–15	766	763	707	[2] 870	43	410	44	......	45	......
1915–16	691	689	621	[3] 910	54	360	33	......	48	......
1916–17	663	661	598	[4] 771	49	352	33	......	......	......
1917–18	548	545	466	614	63	[5] 228	25	......	......	......
1918–19	590	588	476	......	91	260	[5] 30	......	......	......
1919–20	686	684	586	......	75	238	31	103	......	33
1920–21	620	618	532	368	63	194	37	74	[5] 20	33
1921–22	859	855	766	401	61	268	44	175	23	54
1922–23	870	865	721	568	105	206	38	203	25	51
1923–24	922	917	833	784	54	263	37	243	31	53
1924–25	737	734	655	737	58	226	40	148	22	45
1925–26	1,010	1,003	947	906	40	317	44	265	33	58
1926–27	822	815	763	941	33	252	30	204	31	56
1927–28	898	887	814	950	52	269	34	232	22	60
1928–29	974	964	905	760	38	335	34	241	33	72
1929–30	1,011	1,004	940	801	35	321	36	276	31	72
1930–31	1,012	1,006	924	937	45	302	28	274	28	70
1931–32	841	830	778	......	32	263	30	224	22	55
1932–33 [6]	1,021	1,008	944	......	40	329	35	252	32	86

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere, which immediately follow; thus, for 1932–33 the crop harvested in the Northern Hemisphere countries in 1932 is combined with the Southern Hemisphere harvest, which begins late in 1932 and ends early in 1933.

[1] Includes all Russian territory reporting for the years shown.
[2] Exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of Latvia and the Ukraine, and the two Provinces of Batum and Elizabetpol in Transcaucasia.
[4] Beginning with this year, estimates for the present territory of the Union of Socialist Soviet Republics, exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 8,646,000 bushels.
[5] Beginning with this year post-war boundaries, therefore not comparable with earlier years.
[6] Preliminary.

TABLE 32.—*Rye: Acreage, yield per acre, and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Acreage: Average, 1921–22 to 1925–26	Acreage: 1929–30	Acreage: 1930–31	Acreage: 1931–32	Acreage: 1932–33[1]	Yield per acre: Average, 1921–22 to 1925–26	Yield per acre: 1929–30	Yield per acre: 1930–31	Yield per acre: 1931–32	Yield per acre: 1932–33[1]	Production: Average, 1921–22 to 1925–26	Production: 1929–30	Production: 1930–31	Production: 1931–32	Production: 1932–33[1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
North America:															
Canada	1,386	992	1,448	778	774	14.4	13.3	15.2	6.8	12.8	19,994	13,160	22,018	5,322	9,937
United States	4,805	3,054	3,543	3,060	3,271	13.2	11.4	12.8	10.5	12.2	63,553	34,950	45,481	32,026	39,855
Total	6,191	4,046	4,991	3,838	4,045	13.5	11.9	13.5	9.7	12.3	83,547	48,110	67,499	37,348	49,792
Europe:															
Norway	28	18	19	15	16	27.9	29.9	29.3	25.2	32.9	780	538	556	378	527
Sweden	836	633	596	511	514	26.2	25.6	28.8	23.0	33.8	21,911	16,209	17,182	11,744	17,363
Denmark	535	380	369	332	296	24.6	27.4	27.2	25.3		13,162	10,411	10,025	8,406	
Netherlands	501	488	475	445	407	31.4	37.5	31.4	31.8	33.6	15,731	18,300	14,892	14,167	13,660
Belgium	559	567	574	549	573	36.8	39.1	32.5	37.3	35.0	20,564	22,102	18,629	20,482	20,078
Luxemburg	19	18	22	16	17	18.4	23.1	21.8	21.0	24.3	349	416	480	336	413
France	2,196	1,837	1,846	1,760	1,755	18.5	19.8	15.4	16.8	20.1	40,645	36,463	28,393	29,518	35,188
Spain	1,802	1,519	1,551	1,516	1,517	15.4	15.1	13.9	13.9	15.7	27,721	22,935	21,543	21,102	23,780
Portugal	604	394	408	427		8.5	11.9	12.0	11.9		5,110	4,686	4,901	5,070	6,411
Italy	317	308	302	304	294	19.2	22.4	20.3	21.5	21.8	6,100	6,909	6,127	6,521	6,400
Switzerland	55	56	50	46	45	31.8	33.2	29.1	30.5	33.1	1,747	1,862	1,457	1,402	1,488
Germany	10,745	11,680	11,641	10,789	10,996	23.8	27.5	26.0	24.4	29.9	255,937	321,045	302,312	262,977	329,273
Austria	878	925	927	934	944	18.3	21.7	22.3	20.3	25.3	16,086	20,097	20,635	18,931	23,853
Czechoslovakia	2,128	2,690	2,586	2,490	2,569	24.5	26.8	27.2	21.9	33.3	52,200	72,185	70,373	54,631	85,660
Hungary	1,591	1,623	1,611	1,486	1,574	16.9	19.4	17.6	14.6	20.5	26,839	31,423	28,406	21,673	32,205
Yugoslavia	477	587	610	627	600	12.6	14.1	12.8	12.1	13.9	6,001	8,268	7,825	7,614	8,328
Greece	84	128	158	172		12.5	10.5	11.6	10.5		1,051	1,345	1,837	1,800	1,378
Bulgaria	442	536	657	597	544	13.2	13.7	19.2	20.2	18.6	5,831	7,337	12,620	12,072	10,136
Rumania	692	773	968	1,006	850	12.1	17.2	18.9	13.9	15.1	8,371	13,266	18,288	13,962	12,992
Poland	12,911	14,328	14,567	14,262	13,947	16.0	19.3	18.8	15.7	18.1	206,884	275,959	273,923	224,500	252,398
Lithuania	1,355	1,113	1,196	1,257	1,195	16.9	19.8	21.1	13.0	17.4	22,942	22,030	25,177	16,282	20,808
Latvia	624	587	660	572	593	15.3	16.2	21.8	9.8	19.9	9,535	9,503	14,377	5,615	11,825
Estonia	[2] 394	329	367	356	364	[2] 15.9	17.4	24.2	10.3	18.1	[2] 6,246	5,736	8,884	5,820	6,600

Finland	578	503	502	554	544	19.6	20.7	28.1	22.4	25.1	11,316	10,431	14,104	12,411	13,641
Russia	59,672	61,013	69,147	68,378	65,731	11.4	13.0	13.6			679,304	801,496	937,047		
Total European countries reporting all years	39,128	41,118	41,727	40,092	39,867	19.5	22.4	21.7	19.0	23.2	763,736	923,074	906,183	762,137	926,621
Estimated European total, excluding Russia	40,400	42,100	42,700	41,100	40,800						784,000	940,000	924,000	778,000	944,000
Total Northern Hemisphere countries reporting all years	45,319	45,164	46,718	43,930	43,912	18.7	21.5	20.8	18.2	22.2	847,283	971,184	973,682	799,485	976,413
Estimated Northern Hemisphere total, excluding Russia and China	47,100	46,800	48,400	45,600	45,500						875,000	1,004,000	1,006,000	830,000	1,008,000
SOUTHERN HEMISPHERE															
Chile	4	8	8	7	7	16.0	16.2	15.0	11.7		64	130	120	82	
Argentina	380	543	626	[3] 1,378	[3] 1,623	8.1	8.1	6.6	[4] 7.1	[4] 7.3	3,061	4,401	4,129	9,744	11,810
Union of South Africa	[5] 164					[5] 5.5					[5] 909	1,437			
Australia	4	6	6			12.8	13.5	14.5			51	81	87		
Estimated world total, excluding Russia and China	47,600	47,500	49,100	46,300							880,000	1,011,000	1,012,000	841,000	1,021,000

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1932-33 the crop harvested in the Northern Hemisphere countries in 1932 is combined with the Southern Hemisphere harvest which begins late in 1932 and ends early in 1933.

[1] Preliminary. [2] 4-year average. [3] Area sown. [4] Computed from sown acreage. [5] 3-year average.

TABLE 33.—*Rye: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning July—	Percentage of receipts during the crop year												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1922–23	10.7	20.5	14.8	12.3	10.2	8.7	6.5	5.3	4.0	2.9	2.2	1.9	100.0
1923–24	5.3	18.8	19.2	14.2	9.4	8.5	5.4	5.9	3.5	2.5	3.0	4.3	100.0
1924–25	3.9	16.9	25.4	23.3	10.7	7.0	5.0	3.1	1.7	1.0	1.2	.8	100.0
1925–26	5.2	19.2	23.3	12.4	8.7	8.9	6.6	4.6	3.1	2.4	2.8	2.8	100.0
1926–27	8.0	20.1	19.7	13.0	8.5	6.0	6.0	6.0	3.7	2.6	3.0	3.4	100.0
1927–28	4.7	19.0	25.6	17.5	9.8	5.8	4.4	4.1	3.7	2.4	1.7	1.3	100.0
1928–29	4.5	19.5	27.0	16.3	9.3	6.1	4.5	5.1	2.9	1.9	1.4	1.5	100.0
1929–30	12.3	34.0	18.0	11.6	6.6	6.0	3.4	2.3	1.7	1.4	1.5	1.2	100.0
1930–31	11.2	32.7	23.0	11.7	4.7	4.2	2.6	2.7	1.9	1.9	1.8	1.6	100.0
1931–32	11.7	21.6	14.7	10.7	8.6	6.5	6.0	5.5	5.2	3.8	3.3	2.4	100.0

Bureau of Agricultural Economics.

TABLE 34.—*Rye: Commercial stocks, 1926–27 to 1932–33*

DOMESTIC RYE IN UNITED STATES [1]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27							13,092	12,880	13,897	13,905	7,818	3,783
1927–28	1,018	1,454	2,091	2,608	2,077	2,970	3,281	4,027	4,321	5,090	5,544	2,662
1928–29	2,499	2,170	1,351	2,684	4,771	5,589	6,176	6,185	6,440	6,914	6,598	6,532
1929–30	6,632	6,614	8,561	9,771	11,453	12,033	12,914	14,536	14,379	14,285	13,701	12,572
1930–31	12,481	12,073	14,248	17,010	17,291	17,173	16,361	15,629	14,270	13,199	10,990	10,599
1931–32	9,989	9,838	9,405	10,095	10,376	10,431	10,223	10,085	10,006	10,124	9,493	9,416
1932–33	8,942	8,955	9,052	8,700	8,485	8,030						

UNITED STATES RYE IN CANADA

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1926–27							1,658	1,704	1,583	1,384	3,379	859
1927–28	1,465	589	686	1,385	1,390	1,208	930	772	351	259	47	512
1928–29	750	449	357	838	1,248	1,478	1,707	1,426	1,255	1,310	1,367	1,379
1929–30	1,182	1,255	1,540	2,900	2,883	2,113	2,734	2,720	2,519	2,692	2,871	3,821
1930–31	3,789	3,761	3,432	3,139	2,792	2,900	2,131	2,128	2,126	2,119	2,110	1,911
1931–32	1,682	1,792	1,775	1,229	821	782	754	732	675	250	213	295
1932–33	242	160	121	89	99	99						

CANADIAN RYE IN UNITED STATES [2]

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1926–27							2,266	1,922	1,631	494	689	792
1927–28	63	50	20	124	441	802	851	458	203	90	90	371
1928–29	248	255	12	83	205	258	208	532	559	440	451	480
1929–30	380	394	432	320	429	431	431	431	371	370	426	270
1930–31	188	187	172	172	430	651	489	446	528	349	273	2
1931–32	2	2	2	390	388	1,405	1,746	1,708	1,389	1,631	794	600
1932–33	498	347	412	412	502	412						

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the 1st day of the month.

[1] Includes rye in store in public and private elevators in 42 important markets and also the rye afloat in vessels or barges in harbors of lake and seabaord ports. Rye in transit either by rail or water, mill stocks or small private stocks of rye intended only for local purposes, not included.

[2] Includes rye stored at lake and seaboard ports, exclusive of rye in transit on lakes and canals.

TABLE 35.—*Rye: Classification of receipts graded by licensed inspectors, all inspection points, 1923–24 to 1931–32*

Year beginning July—	Grade					
	No. 1	No. 2	No. 3	No. 4	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923–24	14, 394	13. 532	3, 872	1, 061	473	33, 332
1924–25	27, 977	24, 251	8. 841	2, 957	876	64, 902
1925–26	3, 969	11, 730	5, 111	1, 794	494	23, 098
1926–27	3, 892	9, 921	5, 704	3, 597	1, 445	24, 649
1927–28	10, 659	15, 573	4, 976	1, 409	564	33, 181
1928–29	1, 787	13, 081	6, 646	1, 994	626	24, 134
1929–30	8, 985	10, 611	1, 642	475	288	22, 001
1930–31	5, 804	9, 320	1, 198	225	103	16, 650
1931–32	2, 071	5, 531	927	240	71	8, 840

Bureau of Agricultural Economics. 1 car equivalent to 1,300 bushels.

TABLE 36.—*Rye, including flour in terms of grain: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July—									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Germany	15, 498	13, 815	22, 965	7, 235	20, 484	5, 035	4, 518	1, 233	4, 393	18, 075
United States	14, 556	0	9, 488	0	2, 600	0	227	0	909	0
Russia	[2] 7, 482	0	252	0	7, 091	0	29, 084	0	43, 267	0
Poland	6, 597	2, 453	1, 415	792	14, 150	34	15, 743	10	4, 889	226
Hungary	6, 559	1	5, 136	1	5, 942	0	3, 319	0	2, 712	0
Canada	6, 328	129	6, 430	166	835	298	1, 968	18	6, 089	11
Argentina	4, 511	0	5, 862	0	1, 916	0	1, 610	0	9, 272	0
Rumania	1, 133	12	[3] 914	[3] 0	[3] 661	[3] 0	1, 087	1, 180	[3] 3, 027	[3] 0
Bulgaria	486	0	1, 046	0	14	0	2, 444	0	1, 841	0
Yugoslavia [4]	176	6	54	9	60	1	2	6	--------	--------
Algeria [4]	[2] 46	[2] 2	62	6	63	8	62	0	--------	--------
Total	63, 372	16, 418	53, 624	8, 209	53, 816	5, 376	60, 064	2, 447	76, 999	18, 312
PRINCIPAL IMPORTING COUNTIRES										
Denmark	414	8, 109	392	7, 216	394	10, 766	423	13, 468	319	8, 230
Norway	--------	*7, 027*	--------	*6, 024*	--------	7, 047	--------	*5, 216*	--------	6, 293
Finland	10	6, 193	12	7, 757	9	6, 509	5	3, 136	4	2, 048
Czechoslovakia	963	4, 701	1, 664	2, 581	3, 046	502	1, 737	719	886	9, 803
Austria	103	4, 645	64	6, 054	69	5, 258	86	4, 592	59	3, 184
Netherlands	528	4, 525	531	3, 451	207	4, 943	1, 454	11, 267	805	7, 058
Latvia [4]	25	3, 203	16	5, 386	12	3, 916	1	466	--------	--------
Sweden	537	3, 008	260	4, 550	49	4, 225	20	1, 131	50	2, 209
Estonia	--------	2, 244	--------	2, 680	--------	3, 591	--------	515	--------	42
Belgium	43	1, 625	33	376	15	1, 621	240	6, 304	1, 030	4, 860
France	31	1, 535	5	573	12	439	19	4, 286	1	3, 333
United Kingdom [5]	98	696	42	489	25	315	13	345	12	377
Italy	9	386	1	219	1	575	1	1, 323	1	336
Switzerland	0	91	--------	6	--------	296	0	296	1	177
Total	2, 761	47, 988	3, 020	46, 362	3, 839	50, 003	3, 999	53, 064	3, 168	47, 950

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] 4-year average.
[3] Monthly Crop Report and Agricultural Statistics.
[4] Year beginning Aug.; International Yearbook of Agricultural Statistics.
[5] Calendar year.

TABLE 37.—*Rye: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	56.3	55.3	57.2	58.8	62.1	63.9	63.5	64.5	62.8	60.4	60.1	61.6	59.[illegible]
1924–25	68.8	79.8	80.1	105.7	108.6	112.7	126.2	132.2	125.1	100.9	103.6	101.8	96.[illegible]
1925–26	92.3	92.8	81.9	74.1	73.4	86.8	88.2	82.5	73.4	73.8	72.5	76.0	83.[illegible]
1926–27	80.7	86.1	81.6	82.4	83.0	82.4	83.6	88.4	86.4	85.2	90.1	94.9	84.[illegible]
1927–28	91.2	80.6	81.4	81.0	84.0	87.8	88.0	89.5	96.0	99.8	111.5	106.8	84.[illegible]
1928–29	99.2	83.6	81.8	87.1	86.3	87.2	87.9	91.5	91.5	86.0	79.1	75.7	85.[illegible]
1929–30	85.3	91.8	89.2	89.9	85.5	88.4	85.7	78.3	68.4	68.7	63.8	60.7	87.[illegible]
1930–31	43.6	53.0	53.1	47.6	41.6	41.1	37.4	34.9	34.3	32.8	33.0	31.4	47.[illegible]
1931–32	33.0	32.5	33.2	33.6	41.4	36.8	36.8	36.3	37.7	36.6	33.4	28.8	34.[illegible]
1932–33	22.0	23.3	23.6	22.3	22.1	21.1							

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1922–December, 1923.

TABLE 38.—*Rye No. 2: Weighted average price [1] per bushel of reported cash sales, Minneapolis, 1923–24 to 1932–33*

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	61	62	66	66	64	65	67	66	63	61	63	70	6[illegible]
1924–25	83	86	95	121	123	133	154	154	130	106	114	111	11[illegible]
1925–26	95	100	83	77	81	98	99	91	81	85	83	89	8[illegible]
1926–27	102	97	93	95	94	94	99	102	99	99	109	111	9[illegible]
1927–28	104	92	92	92	99	102	103	106	114	124	128	123	10[illegible]
1928–29	111	94	94	94	98	97	101	105	100	89	85	84	9[illegible]
1929–30	107	98	97	97	95	98	91	78	66	68	65	57	9[illegible]
1930–31	55	60	55	49	43	44	38	37	36	35	36	37	5[illegible]
1931–32	37	38	39	41	51	45	46	46	47	45	39	32	4[illegible]
1932–33	32	34	34	32	31	31							

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record. Chicago prices, 1909–1927 appear in 1927 Yearbook, Table 46. Minneapolis prices, 1909–1921, appear in 1930 Yearbook, Table 43.

[1] Average of daily prices weighted by car-lot sales.

TABLE 39.—*Corn: Acreage, production, value, exports, etc., United States, 1890–1932*

Year	Acreage harvested	Average yield per acre	Production		Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Price per bushel at Chicago [1]	Foreign trade, including meal, year beginning July [2]			
			In grain equivalent on entire acreage	Harvested as grain				Domestic exports	Imports	Net exports [3]	
										Total	Percentage of production
	1,000 acres	*Bushels of 56 lbs. shelled*	*1,000 bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1890	70, 390	20. 7	1, 460, 406	----------	50. 0	729, 647	58	32, 042	2	32, 039	2. 2
1891	74, 496	27. 6	2, 055, 823	----------	39. 7	816, 917	47	76, 602	16	76, 596	3. 7
1892	72, 610	23. 6	1, 713, 688	----------	38. 8	644, 390	41	47, 122	2	47, 120	2. 7
1893	74, 434	22. 9	1, 707, 572	----------	35. 9	612, 998	41	66, 490	3	66, 487	3. 9
1894	69, 396	19. 3	1, 339, 680	----------	45. 1	604, 523	44	28, 585	17	28, 569	2. 1
1895	85, 567	27. 0	2, 310, 952	----------	25. 0	578, 408	26	101, 100	5	101, 096	4. 4
1896	86, 560	28. 9	2, 503, 484	----------	21. 3	532, 884	25	178, 817	7	178, 811	7. 1
1897	88, 127	24. 3	2, 144, 553	----------	26. 0	558, 309	30	212, 056	4	212, 052	9. 9
1898	88, 304	25. 6	2, 261, 119	----------	28. 4	642, 747	34	177, 255	4	177, 252	7. 8
1899	*94, 914*	*28. 1*		*2, 666, 324*							
1899	94, 914	25. 9	2, 454, 628	----------	29. 9	734, 916	36	213, 123	3	213, 121	8. 7
1900	95, 042	26. 4	2, 505, 148	----------	35. 1	878, 243	43	181, 405	5	181, 400	7. 2
1901	94, 636	17. 0	1, 613, 528	----------	60. 1	969, 285	62	28, 029	19	28, 011	1. 7
1902	95, 517	27. 4	2, 619, 499	----------	40. 1	1, 049, 791	47	76, 639	41	76, 598	2. 9
1903	90, 661	25. 9	2, 346, 897	----------	42. 1	987, 882	49	58, 222	17	58, 210	2. 5
1904	93, 340	27. 1	2, 528, 662	----------	43. 7	1, 105, 690	48	90, 293	16	90, 278	3. 6
1905	93, 573	29. 4	2, 748, 949	----------	40. 8	1, 120, 513	44	119, 894	11	119, 883	4. 4
1906	93, 643	30. 9	2, 897, 662	----------	39. 3	1, 138, 053	50	86, 368	11	86, 358	3. 0
1907	94, 971	26. 5	2, 512, 065	----------	50. 9	1, 277, 607	68	55, 064	20	55, 044	2. 2
1908	95, 603	26. 6	2, 544, 957	----------	60. 0	1, 527, 679	65	37, 665	258	37, 437	1. 5
1909	*98, 383*	*25. 9*		*2, 552, 190*							
1909	98, 383	26. 1	2, 572, 336	----------	58. 6	1, 507, 185	59	38, 128	118	38, 010	1. 5
1910	104, 035	27. 7	2, 886, 260	----------	48. 0	1, 384, 817	53	65, 615	53	65, 562	2. 3
1911	105, 825	23. 9	2, 531, 488	----------	61. 8	1, 565, 258	71	41, 797	54	41, 744	1. 6
1912	107, 083	29. 2	3, 124, 746	----------	48. 7	1, 520, 454	53	50, 780	903	49, 913	1. 6
1913	105, 820	23. 1	2, 446, 988	----------	69. 1	1, 692, 092	70	10, 726	12, 368	[4] 1, 639	------
1914	103, 435	25. 8	2, 672, 804	----------	64. 4	1, 722, 070	70	50, 668	9, 899	40, 816	1. 5
1915	106, 197	28. 2	2, 994, 793	----------	57. 5	1, 722, 680	79	39, 897	5, 211	34, 761	1. 2
1916	105, 296	24. 4	2, 566, 927	----------	88. 0	2, 280, 729	111	66, 753	2, 270	65, 092	2. 5
1917	116, 730	26. 3	3, 065, 233	----------	127. 9	3, 920, 228	163	49, 073	3, 197	45, 950	1. 5
1918	104, 467	24. 0	2, 502, 665	----------	136. 5	3, 416, 240	162	23, 019	3, 346	19, 684	. 8
1919 [5]	*87, 772*	*26. 7*		*2, 345, 833*							
1919	97, 407	27. 2	2, 648, 826	----------	134. 3	3, 558, 193	159	16, 720	10, 283	6, 509	. 2
1920	100, 950	30. 2	3, 049, 317	----------	65. 6	2, 000, 567	62	70, 906	5, 791	66, 116	2. 1
1921	102, 798	28. 3	2, 912, 091	----------	41. 3	1, 201, 472	55	179, 490	142	179, 374	5. 8
1922	99, 835	26. 9	2, 688, 531	----------	65. 0	1, 748, 472	73	96, 596	182	96, 415	3. 3
1923	100, 801	28. 4	2, 860, 438	----------	71. 4	2, 041, 984	88	23, 135	240	22, 896	. 7
1924 [5]	*82, 329*	*22. 2*		*1, 823, 880*							
1924	100, 420	23. 0	2, 305, 196	1, 899, 751	97. 8	2, 255, 018	106	9, 791	4, 618	5, 348	. 2
1925	101, 331	28. 2	2, 853, 183	2, 413, 364	67. 0	1, 911, 881	75	24, 783	637	24, 150	. 8
1926	99, 452	25. 9	2, 574, 602	2, 133, 404	63. 8	1, 643, 276	87	19, 819	1, 098	18, 731	. 7
1927	98, 357	27. 2	2, 677, 742	2, 249, 926	71. 8	1, 923, 512	101	19, 409	5, 463	14, 364	. 5
1928	100, 336	27. 1	2, 714, 591	2, 282, 938	74. 6	2, 024, 860	92	41, 874	490	41, 387	1. 5
1929 [5]	*85, 162*	*25. 0*		*2, 130, 752*							
1929	97, 806	25. 9	2, 535, 386	2, 140, 177	[6] 79. 8	[7] 2, 024, 004	83	10, 281	497	9, 788	. 4
1930	100, 793	20. 4	2, 059, 641	1, 733, 653	[6] 59. 4	[7] 1, 224, 074	60	3, 317	1, 747	1, 572	. 1
1931	105, 301	24. 4	2, 567, 306	2, 215, 262	[6] 32. 1	[7] 824, 869	36	3, 969	386	3, 583	. 1
1932 [8]	107, 729	27. 0	2, 908, 045	2, 508, 920	[6] 19. 5	[7] 566, 930	------	------	------	------	------

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. See 1927 Yearbook, p. 774, for data for earlier years.

[1] Prices 1890–1898 are averages of the weekly quotations for No. 2 or better in annual reports of Chicago Board of Trade; subsequent prices are compiled from the Chicago Daily Trade Bulletin, average of daily prices weighted by car-lots sales, No. 3 yellow.

[2] Compiled from Commerce and Navigation of the United States, 1890–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932 and official records of the Bureau of Foreign and Domestic Commerce. Corn—General imports 1890–1909 and 1912–1932; imports for consumption 1910–11. Corn meal—Imports for consumption, 1890–1932. Corn meal converted to terms of grain on the basis of 4 bushels of corn to a barrel of meal.

[3] Total exports (domestic plus foreign) minus total imports.

[4] Net imports, i. e., total imports minus total exports (domestic plus foreign).

[5] Corn harvested for grain; total acreage of corn in 1924 is 98,401,627 acres, 1929, 97,740,740 acres.

[6] Weighted average price for crop marketing season.

[7] Based on weighted average price for crop marketing season.

[8] Preliminary.

TABLE 40.—*Corn: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932[1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Maine	13	14	16	39. 7	42. 0	41. 0	489	588	656	56	47
New Hampshire	14	13	14	42. 6	46. 0	40. 0	583	598	560	58	44
Vermont	70	64	64	41. 1	46. 0	41. 0	2, 837	2, 944	2, 624	53	42
Massachusetts	43	37	38	43. 3	43. 0	40. 0	1, 798	1, 591	1, 520	59	50
Rhode Island	8	8	9	40. 4	43. 0	39. 0	332	344	351	61	50
Connecticut	52	51	54	40. 6	42. 0	42. 0	2, 039	2, 142	2, 268	60	54
New York	619	566	594	37. 0	39. 0	35. 0	21, 417	22, 074	20, 790	52	41
New Jersey	188	170	165	41. 6	41. 0	42. 0	7, 855	6, 970	6, 930	50	38
Pennsylvania	1, 290	1, 268	1, 255	43. 0	49. 5	37. 0	53, 366	62, 766	46, 435	43	40
North Atlantic	2, 297	2, 191	2, 209	41. 1	45. 6	37. 2	90, 717	100, 017	82, 134	46. 6	40. 8
Ohio	3, 538	3, 576	3, 433	37. 8	45. 0	35. 5	128, 042	160, 920	121, 872	30	20
Indiana	4, 673	4, 734	4, 639	36. 1	39. 0	37. 5	165, 420	184, 626	173, 962	25	16
Illinois	9, 049	9, 185	9, 001	36. 0	37. 0	43. 0	328, 470	339, 845	387, 043	25	15
Michigan	1, 417	1, 407	1, 463	33. 0	29. 1	33. 0	43, 998	40, 944	48, 279	37	28
Wisconsin	2, 082	2, 080	2, 184	34. 4	28. 0	37. 0	67, 168	58, 240	80, 808	42	26
Minnesota	4, 383	4, 896	4, 847	32. 6	23. 5	36. 5	135, 170	115, 056	176, 916	33	14
Iowa	11, 124	11, 732	11, 732	40. 4	32. 9	46. 0	417, 713	385, 983	539, 672	28	13
Missouri	6, 314	6, 184	6, 122	29. 0	27. 5	30. 5	180, 603	170, 060	186, 721	32	19
North Dakota	1, 045	1, 190	1, 404	24. 2	18. 5	19. 0	22, 094	22, 016	26, 676	30	15
South Dakota	4, 828	4, 837	4, 982	25. 6	5. 2	14. 7	104, 403	25, 152	73, 235	31	13
Nebraska	9, 124	10, 042	10, 644	25. 7	17. 0	25. 3	213, 537	170, 714	269, 293	30	13
Kansas	6, 358	6, 573	7, 362	21. 6	17. 5	18. 5	140, 024	115, 028	136, 197	28	16
North Central	63, 933	66, 436	67, 813	32. 2	26. 9	32. 7	1, 946, 643	1, 788, 583	2, 220, 674	28. 9	15. 6
Delaware	136	146	147	28. 9	32. 5	29. 0	3, 833	4, 745	4, 263	39	30
Maryland	512	545	548	33. 2	38. 0	30. 0	16, 756	20, 710	16, 440	39	32
Virginia	1, 544	1, 527	1, 466	23. 5	28. 2	18. 0	35, 681	43, 061	26, 388	44	41
West Virginia	463	446	446	28. 2	29. 0	25. 0	12, 897	12, 934	11, 150	50	45
North Carolina	2, 095	2, 345	2, 322	18. 5	20. 5	15. 0	37, 722	48, 072	34, 830	41	45
South Carolina	1, 516	1, 608	1, 656	14. 4	14. 3	10. 8	20, 227	22, 994	17, 885	46	46
Georgia	3, 673	3, 672	3, 856	11. 3	10. 0	10. 0	39, 408	36, 720	38, 560	48	34
Florida	615	674	687	11. 9	8. 5	8. 5	7, 428	5, 729	5, 840	52	42
South Atlantic	10, 554	10, 963	11, 128	17. 0	17. 8	14. 0	173, 953	194, 965	155, 356	44. 2	39. 8
Kentucky	3, 052	2, 928	2, 811	24. 2	28. 5	24. 0	74, 035	83, 448	67, 464	34	28
Tennessee	3, 007	2, 927	2, 927	22. 2	25. 0	20. 3	63, 675	73, 175	59, 418	36	30
Alabama	2, 726	3, 042	3, 224	13. 4	14. 0	11. 5	35, 985	42, 588	37, 076	43	36
Mississippi	2, 085	2, 299	2, 414	14. 8	18. 5	13. 5	30, 582	42, 532	32, 589	40	36
Arkansas	2, 039	1, 954	1, 993	18. 1	22. 5	18. 0	35, 455	43, 965	35, 874	37	28
Louisiana	1, 201	1, 287	1, 261	15. 5	16. 0	14. 2	17, 978	20, 592	17, 906	44	38
Oklahoma	2, 800	3, 321	3, 288	19. 4	15. 6	20. 0	53, 362	51, 808	65, 760	27	18
Texas	3, 873	5, 236	5, 707	17. 8	17. 5	18. 0	67, 124	91, 630	102, 726	33	25
South Central	20, 785	22, 904	23, 625	18. 5	19. 6	17. 7	378, 196	449, 738	418, 813	35. 5	27. 7
Montana	233	123	215	14. 9	14. 0	12. 0	3, 080	1, 722	2, 580	53	35
Idaho	54	42	55	36. 8	36. 0	41. 0	2, 027	1, 512	2, 255	58	31
Wyoming	181	190	213	16. 3	10. 0	9. 5	2, 861	1, 900	2, 024	46	26
Colorado	1, 499	1, 836	1, 909	13. 9	9. 5	7. 0	17, 658	17, 442	13, 363	36	22
New Mexico	218	283	297	15. 4	16. 0	11. 0	3, 159	4, 528	3, 267	39	32
Arizona	33	36	41	17. 3	16. 0	15. 0	554	576	615	76	65
Utah	14	16	20	23. 6	20. 0	27. 0	351	320	540	71	56
Nevada	2	2	2	25. 4	20. 0	24. 0	49	40	48	75	62
Washington	37	37	38	35. 4	37. 0	34. 0	1, 292	1, 369	1, 292	56	40
Oregon	61	62	65	30. 8	32. 0	31. 0	1, 943	1, 984	2, 015	65	51
California	78	90	99	32. 4	29. 0	31. 0	2, 581	2, 610	3, 069	64	48
Western	2, 410	2, 717	2, 954	16. 8	12. 5	10. 5	35, 554	34, 003	31, 068	44. 5	31. 7
United States	99, 979	105, 301	107, 729	27. 2	24. 4	27. 0	2, 625, 063	2, 567, 306	2, 908, 045	32. 1	19. 5

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 41.—*Corn: Utilization for grain, silage, hogging down, grazing, and forage, by States, 1931 and 1932*

State and division	1931					1932[1]				
	For grain		For silage		Hogging down, grazing, and forage acreage	For grain		For silage		Hogging down, grazing, and forage acreage
	Acreage	Production	Acreage	Production		Acreage	Production	Acreage	Production	
	1,000 acres	*1,000 bushels*	*1,000 acres*	*1,000 short tons*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 acres*	*1,000 short tons*	*1,000 acres*
Maine	2	84	9	92	3	2	82	10	115	4
New Hampshire	3	135	8	88	2	3	120	9	94	2
Vermont	7	322	48	542	9	8	328	47	494	9
Massachusetts	9	387	21	235	7	9	360	21	242	8
Rhode Island	1	43	5	55	2	1	39	6	60	2
Connecticut	12	504	33	346	6	13	540	34	374	7
New York	*100*	*3,900*	*367*	*4,037*	*99*	*106*	*3,710*	*385*	*3,658*	*103*
New Jersey	134	5,628	29	284	7	127	5,334	30	264	8
Pennsylvania	946	46,827	247	2,594	75	924	34,188	270	2,160	61
North Atlantic	1,214	57,830	767	8,273	210	1,193	44,707	812	7,461	204
Ohio	3,190	145,145	125	1,188	261	3,096	109,908	117	994	220
Indiana	4,453	173,667	101	798	180	4,337	162,638	84	714	218
Illinois	*8,469*	*313,353*	*211*	*1,582*	*505*	*8,524*	*366,532*	*162*	*1,296*	*315*
Michigan	761	23,591	297	2,079	349	850	28,050	241	2,048	372
Wisconsin	677	19,633	1,145	7,672	258	883	33,554	1,054	7,905	247
Minnesota	3,116	74,784	528	3,432	1,252	3,266	119,209	396	3,168	1,185
Iowa	9,987	332,567	345	2,415	1,400	10,184	468,464	258	2,322	1,290
Missouri	5,479	150,672	50	315	655	5,559	169,550	43	280	520
North Dakota	188	3,478	74	252	928	128	2,432	112	280	1,164
South Dakota	2,794	22,911	203	528	1,840	3,542	55,255	105	504	1,335
Nebraska	9,148	155,516	120	504	774	10,006	253,126	75	315	504
Kansas	5,515	99,270	348	1,566	710	6,317	120,023	250	1,250	795
North Central	53,777	1,514,587	3,547	22,331	9,112	56,691	1,888,741	2,897	21,076	8,225
Delaware	142	4,615	3	26	1	143	4,147	3	36	1
Maryland	510	19,380	25	250	10	510	15,300	29	261	9
Virginia	1,433	40,411	63	630	31	1,383	24,894	54	351	29
West Virginia	418	12,122	19	180	9	408	10,200	28	224	10
North Carolina	2,244	46,002	12	64	89	2,203	33,045	12	54	107
South Carolina	1,572	22,480	3	18	33	1,617	17,464	3	12	36
Georgia	3,540	35,400	7	38	125	3,721	37,210	7	32	128
Florida	645	5,482	2	13	27	658	5,593	2	9	27
South Atlantic	10,504	185,892	134	1,219	325	10,643	147,853	138	979	347
Kentucky	2,729	76,412	26	182	173	2,710	65,040	14	98	87
Tennessee	2,854	71,350	20	120	53	2,838	57,611	13	72	76
Alabama	3,017	42,238	5	25	20	3,180	36,570	5	20	39
Mississippi	2,259	41,792	2	12	38	2,387	32,224	2	10	25
Arkansas	1,808	40,680	2	12	144	1,858	33,444	2	10	133
Louisiana	1,261	20,176	2	6	24	1,239	17,594	2	6	20
Oklahoma	3,153	50,448	12	54	156	3,176	64,790	12	48	100
Texas	5,099	89,232	8	30	129	5,557	100,026	8	30	142
South Central	22,180	432,328	77	441	737	22,945	407,299	58	294	622
Montana	20	350	2	10	101	55	715	8	20	152
Idaho	26	936	6	45	10	30	1,230	9	68	16
Wyoming	72	792	2	8	116	75	825	3	12	135
Colorado	1,461	15,340	50	200	325	1,373	10,984	60	180	476
New Mexico	*243*	*3,888*	*4*	*24*	*36*	*257*	*2,827*	*4*	*24*	*36*
Arizona	25	400	4	28	7	29	435	4	28	8
Utah	7	154	3	24	6	8	216	5	50	7
Nevada	1	24	1	7	0	1	24	1	10	0
Washington	11	407	10	100	16	12	408	10	100	16
Oregon	25	750	22	143	15	32	992	20	130	13
California	46	1,584	21	178	21	52	1,664	23	196	24
Western	1,939	24,625	125	767	653	1,924	20,320	147	818	883
United States	89,614	2,215,262	4,650	33,031	11,037	93,396	2,508,920	4,052	30,628	10,281

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 42.—*Corn: World production, 1900–1901 to 1932–33*

Crop year	Estimated world production, excluding Russia	Estimated European production, excluding Russia	Selected countries						
			United States	Argentina	Rumania	Yugoslavia	Italy	Brazil	Russia[1]
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1900–1901	3, 593	445	2, 505	99	85	18	88	-------	34
1901–2	2, 762	497	1, 614	84	117	19	100	-------	68
1902–3	3, 686	391	2, 619	149	68	18	71	-------	49
1903–4	3, 554	459	2, 347	175	80	19	89	-------	51
1904–5	3, 505	279	2, 529	141	20	9	90	-------	26
1905–6	3, 904	403	2, 749	195	59	21	97	-------	34
1906–7	4, 095	533	2, 898	72	131	28	93	-------	92
1907–8	3, 761	441	2, 512	136	58	18	88	-------	64
1908–9	3, 789	465	2, 545	177	79	21	96	-------	82
1909–10	3, 946	499	2, 572	175	70	34	102	-------	55
1910–11	4, 152	564	2, 886	28	104	29	104	-------	102
1911–12	3, 895	502	2, 531	296	111	27	95	-------	95
1912–13	4, 448	547	3, 125	197	104	-------	101	-------	94
1913–14	3, 944	576	2, 447	263	115	-------	111	-------	84
1914–15	4, 190	559	2, 673	325	103	-------	105	-------	[2] 90
1915–16	4, 351	520	2, 995	161	86	-------	122	-------	[3] 72
1916–17	3, 777	389	2, 567	59	-------	-------	82	204	[4] 62
1917–18	4, 178	351	3, 065	171	-------	-------	83	95	-------
1918–19	3, 579	299	2, 503	224	-------	-------	77	87	-------
1919–20	4, 075	454	2, 649	259	[5] 141	-------	86	197	-------
1920–21	4, 530	519	3, 049	230	182	[5] 101	89	186	46
1921–22	4, 154	393	2, 912	176	111	74	92	181	46
1922–23	4, 025	424	2, 689	176	120	90	77	202	81
1923–24	4, 332	469	2, 860	277	153	85	89	180	67
1924–25	3, 874	589	2, 305	186	155	149	106	162	91
1925–26	4, 517	626	2, 853	322	164	149	110	162	172
1926–27	4, 375	653	2, 575	321	230	134	118	164	131
1927–28	4, 241	485	2, 678	312	139	83	87	133	118
1928–29	4, 224	384	2, 715	252	109	72	65	194	130
1929–30	4, 317	705	2, 535	281	251	163	100	174	119
1930–31	3, 904	611	2, 060	420	178	136	118	200	105
1931–32	4, 307	629	2, 567	285	239	126	77	-------	-------
1932–33[6]	-------	748	2, 906	-------	224	178	119	-------	-------

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which takes place early in 1932.

[1] Includes all Russian territory reporting for the years shown.

[2] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

[3] Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and the Provinces of Batum and Elizabetpol in Transcaucasia.

[4] Beginning this year, estimates within present boundaries of the Union of Socialist Soviet Republics, exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924–25 produced 26,048,000 bushels.

[5] Production in present boundaries beginning this year, therefore not comparable with earlier years.

[6] Preliminary.

TABLE 43.—*Corn: Acreage, yield per acre, and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Acreage					Yield per acre					Production				
	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
North America:															
Canada	293	152	161	132	130	44.3	34.1	36.2	41.3	38.9	12,974	5,183	5,820	5,449	5,057
United States	101,037	97,806	100,793	105,301	107,729	27.0	25.9	20.4	24.4	27.0	2,723,888	2,535,380	2,059,041	2,567,306	2,908,045
Mexico	7,575	7,080	7,598	8,346	7,944	11.3	8.2	7.1	10.1	9.6	85,241	57,824	54,200	84,195	76,450
Guatemala	390	347	418			19.9	14.4	14.7			7,772	5,006	6,137		13,240
Total North American countries reporting area and production all years	108,905	105,038	108,552	113,779	115,803	25.9	24.7	19.5	23.4	25.8	2,822,103	2,598,393	2,119,667	2,656,950	2,989,558
Estimated North American total	110,100	106,200	109,800	115,000	117,000						2,841,000	2,613,000	2,136,000	2,673,000	3,013,000
Europe:															
France	830	839	833	855	813	17.8	22.2	26.9	28.8	22.0	14,754	18,657	22,379	24,622	17,924
Spain	1,167	1,006	1,106	1,053	1,082	22.2	24.6	26.1	25.1	24.4	25,933	24,793	28,843	26,388	26,384
Portugal	762	904	900	939		15.5	16.5	18.6	18.8		11,795	14,924	16,722	17,683	15,976
Italy	3,792	3,719	3,745	3,450	3,582	25.0	26.8	31.4	22.2	33.1	94,793	99,622	117,560	76,618	118,703
Austria	140	138	143	152	148	25.4	33.5	33.3	32.8	32.5	3,553	4,617	4,756	4,990	4,803
Czechoslovakia	390	333	360	344	331	26.8	27.4	27.2	26.1	36.8	10,444	9,113	9,783	8,965	12,170
Hungary	2,425	2,774	2,605	2,720	2,877	24.1	25.5	21.3	22.0	33.3	58,353	70,631	55,395	59,748	95,893
Yugoslavia	4,759	5,883	5,926	6,168	6,442	23.0	27.8	23.0	20.4	27.6	109,399	163,285	136,393	126,111	177,939
Bulgaria	1,458	1,977	1,689	1,682	1,829	14.4	18.7	18.1	20.8	22.7	21,021	37,005	30,514	34,968	41,511
Rumania	8,799	11,848	10,938	11,749	11,775	16.0	21.2	16.3	20.3	19.1	140,515	251,410	177,940	238,700	224,397
Poland	197	218	233	243	240	14.9	17.2	14.2	16.9		2,926	3,752	3,299	4,099	
Russia, European and Asiatic	5,238	8,755	8,686	9,742	9,084	17.4	13.6	12.1			91,344	118,838	105,015		
Total European countries reporting area and production, all years	23,760	28,517	27,345	28,173	28,879	20.2	23.8	21.3	21.3	24.9	478,765	679,133	583,563	601,130	719,730
Estimated European total, excluding Russia	25,200	30,200	29,100	30,100	30,700						500,000	705,000	611,000	629,000	748,000
Africa:															
Morocco	437	600	649	864		8.3	9.1	9.2	6.2		3,629	5,455	5,990	5,326	
Egypt	1,988	1,917	1,896	2,194		34.8	36.2	36.9	35.6		69,096	69,462	69,886	78,201	75,704
Estimated African total	3,100	4,200	4,400	4,400	4,300						84,000	107,000	106,000	105,000	112,000

[1] Preliminary.

TABLE 43.—*Corn: Acreage, yield per acre, and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*—Con.

Country	Acreage: Average, 1921–22 to 1925–26	Acreage: 1929–30	Acreage: 1930–31	Acreage: 1931–32	Acreage: 1932–33	Yield per acre: Average, 1921–22 to 1925–26	Yield per acre: 1929–30	Yield per acre: 1930–31	Yield per acre: 1931–32	Yield per acre: 1932–33	Production: Average, 1921–22 to 1925–26	Production: 1929–30	Production: 1930–31	Production: 1931–32	Production: 1932–33
NORTHERN HEMISPHERE—continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Asia:															
India	6,570	6,641	7,410	6,458		12.6	12.1	13.2	14.9		82,482	80,040	97,920	96,520	
Japan	141	110	113			25.9	23.7	25.5			3,655	2,608	2,887		
Manchuria	[2] 1,457	2,236	2,139	2,441		[3] 37.2	28.3	29.2	27.6		[3] 51,167	63,314	62,554	67,417	55,896
Chosen	231	261	263	267		12.2	12.4	12.8	11.8		2,829	3,237	3,366	3,152	
Kwantung	162	220	230			17.1	21.5	20.7			2,771	4,721	4,751		
Philippines	1,338	1,273	1,277	1,295		12.4	11.1	11.5	10.5		16,561	14,144	14,737	13,565	
Estimated Asiatic total	11,200	12,200	12,900	11,900	11,900						187,000	203,000	216,000	217,000	201,000
Total Northern Hemisphere countries reporting area and production, all years	132,665	133,555	135,897	141,952	144,682	24.9	24.5	19.9	23.0	25.6	3,300,868	3,277,526	2,703,230	3,258,080	3,709,288
Estimated Northern Hemisphere total, excluding Russia	149,600	152,800	156,200	161,400	163,900						3,612,000	3,628,000	3,069,000	3,624,000	4,074,000
SOUTHERN HEMISPHERE															
Brazil	6,980					25.4					177,338	173,878	200,140		
Chile	62	94	92	110		23.6	25.0	29.4	31.6		1,466	2,346	2,707	3,473	
Uruguay	470	532	483	483		10.5	13.5	11.9	11.9		4,919	7,168	5,759	5,759	
Argentina	8,063	10,428	11,577	9,518		28.2	26.9	36.2	29.9		227,393	280,617	419,661	284,826	
Union of South Africa	4,456	6,397	5,370	5,732		12.8	12.5	10.6	10.8		56,890	79,949	57,171	61,625	
Southern Rhodesia	223	318	273	255		18.3	21.5	18.8	22.4		4,079	6,847	5,131	5,714	
Java and Madura	3,983	4,214	4,947	4,779		14.4	14.7	15.9	15.7		57,410	62,059	78,850	75,224	
Australia	326	298	293	286		26.5	26.7	27.4	27.7		8,641	7,946	8,026	7,929	
Total Southern Hemisphere countries reporting area and production, all years through 1931–32	17,583	22,281	23,035	21,163		20.5	20.1	25.1	21.0		360,798	446,932	577,305	444,550	
Estimated Southern Hemisphere total	26,000	33,400	33,100	31,200							568,000	689,000	835,000	683,000	
Total Northern and Southern Hemisphere countries reporting area and production, all years through 1931–32	163,228	169,886	173,699	177,816		23.9	23.4	20.5	22.4		3,902,151	3,978,786	3,555,009	3,988,593	
Estimated world total, excluding Russia	175,600	186,200	189,300	192,600							4,180,000	4,317,000	3,904,000	4,307,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in the Northern Hemisphere in 1931 is combined with the Southern Hemisphere harvest which takes place early in 1932.

[1] Preliminary. [2] 2-year average. [3] 3-year average.

TABLE 44.—*Corn: Monthly marketings, by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning October	Percentage of receipts during the crop year												
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Season
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1922–23	8.2	8.7	13.6	10.7	11.0	6.6	5.3	6.1	6.4	6.8	7.5	9.1	100.0
1923–24	5.6	10.4	12.3	12.0	13.3	7.4	6.1	5.9	6.0	6.8	7.2	6.1	100.0
1924–25	7.0	11.1	13.0	13.6	9.5	8.1	6.3	7.8	4.3	6.6	6.2	6.5	100.0
1925–26	5.9	9.3	14.6	12.1	10.4	8.5	5.3	7.1	8.2	5.1	7.6	5.9	100.0
1926–27	10.1	9.1	12.9	11.7	10.8	6.9	4.8	6.1	9.1	5.7	6.2	6.6	100.0
1927–28	6.2	8.6	15.5	13.8	11.7	8.9	5.4	6.6	5.4	5.1	6.5	6.3	100.0
1928–29	6.6	12.5	16.7	12.9	11.5	7.4	3.8	4.3	7.3	5.8	5.8	5.4	100.0
1929–30	6.9	9.3	13.4	10.9	10.6	7.4	7.1	6.9	6.3	6.6	7.0	7.6	100.0
1930–31	7.7	10.5	14.0	11.0	10.2	8.2	7.0	5.8	6.5	6.5	7.3	5.3	100.0
1931–32	7.6	9.9	11.2	10.2	10.4	7.6	7.4	6.4	5.4	6.2	8.6	9.1	100.0

Bureau of Agricultural Economics.

TABLE 45.—*Shelled corn: Classification of receipts graded by licensed inspectors, all inspection points, total of all classes under each grade, 1917–18 to 1931–32*

Year beginning November	Grade							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1922–23	21,580	141,563	98,932	24,262	4,270	3,526	3,711	297,844
1923–24	3,038	59,592	111,932	69,365	35,905	15,410	10,742	305,984
1924–25	7,883	80,883	56,542	34,431	31,370	17,252	12,345	240,706
1925–26	3,358	59,985	62,757	51,092	48,348	40,116	31,473	297,129
1926–27	1,616	34,390	57,931	48,217	50,195	46,180	31,171	269,700
1927–28	9,682	87,801	78,352	47,890	34,638	27,553	29,006	314,922
1928–29	25,809	92,258	73,331	93,367	40,594	10,400	7,247	343,033
1929–30	26,394	85,038	49,806	50,916	39,995	19,475	16,580	288,204
1930–31	18,176	67,781	70,928	45,629	14,745	5,262	3,745	226,266
1931–32	15,469	91,136	53,076	22,756	3,987	3,159	2,465	192,048

Bureau of Agricultural Economics. 1 car equivalent to 1,300 bushels.

TABLE 46.—*Corn: Commercial stocks, 1926–27 to 1932–33*

DOMESTIC CORN IN UNITED STATES[1]

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27			36,019	40,670	47,515	49,759	39,010	31,224	36,268	31,782	23,324	24,913
1927–28	21,661	20,254	28,741	30,717	44,786	48,273	36,835	27,497	17,650	12,304	9,768	6,894
1928–29	2,032	6,353	18,565	28,797	36,927	37,744	28,863	15,951	13,740	9,086	6,340	4,421
1929–30	3,639	2,982	8,228	16,079	24,944	25,671	21,073	11,463	7,049	3,421	4,220	4,710
1930–31	4,550	7,332	17,190	17,383	20,127	22,174	19,697	12,337	7,279	8,363	9,066	5,587
1931–32	7,341	9,803	12,664	14,176	18,528	22,693	22,032	20,708	16,117	11,144	14,739	18,705
1932–33	27,973	26,537										

UNITED STATES CORN IN CANADA

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
1926–27			2,147	1,715	1,788	1,403	1,781	1,452	1,184	1,706	1,188	2,010
1927–28	1,994	2,263	1,891	1,598	1,312	976	626	1,634	1,337	818	510	534
1928–29	252	268	580	737	601	356	1,759	1,602	911	746	480	987
1929–30	847	375	253	180	152	120	428	745	697	135	147	928
1930–31	750	723	571	481	423	388	476	995	176	195	557	500
1931–32	1,143	1,106	918	884	872	843	1,051	992	817	549	759	2,826
1932–33	3,399	4,211										

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the first day of the month.

[1] Includes corn in store in public and private elevators in 42 important markets and also the corn afloat in vessels or barges in the harbors of lake and seaboard ports. Corn in transit either by rail or water, mill stocks, or small private stocks of corn intended only for local purposes, not included.

TABLE 47.—*Corn, including corn meal in terms of grain: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	220,588	0	243,424	0	168,585	0	274,027	0	386,818	0
Rumania	30,906	[2] 21	[3] 3,712	(3)	[3] 31,030	(3)	38,301	1	[3] 54,474	(3)
United States	23,233	1,637	41,874	490	10,281	496	3,317	1,747	3,969	386
Union of South Africa	19,446	376	18,769	129	18,361	52	21,880	30	10,998	27
Yugoslavia	[4] 8,534		534		18,436		14,924		3,467	
Russia	[5] 5,673				1,352		2,478		10,897	
Dutch East Indies [6]	4,876	13	8,500	15	6,832	18	4,728	18	6,555	20
Hungary	4,043	508	802	1,124	6,109	350	628	3,275	123	2,605
Bulgaria	3,828		2,000		5,610		7,744		4,721	
Indo-China	3,554	0	[3] 4,363	[3] 0	[3] 5,400	[3] 0	[3] 5,602	[3] 0	4,397	0
Egypt	1,786	276	2,761	31	77	82	14	274	15	497
China [6]	1,040	0	945	0	2,022	0	1,064	0	1,560	0
Uruguay [6]	561	[4] 406	2,364	274	394	282	601	225		
British India	227	0	29	0	6	0	2	0	4	0
Total	328,295	3,237	330,077	2,063	274,495	1,280	376,310	5,570	487,998	3,595
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	2,512	71,650	2,308	71,672	2,313	68,763	2,595	83,280	3,183	114,684
Netherlands	738	44,523	717	41,471	1,067	41,798	863	48,785	518	69,910
Germany	23	42,826	5	32,915	2	31,578	2	17,320	0	29,723
France	69	27,349	21	30,771	89	29,929	126	36,788	127	46,513
Belgium	1,080	24,268	1,090	22,630	1,017	21,892	1,589	27,224	2,992	35,389
Italy	42	23,942	16	40,971	26	27,240	16	25,256	12	34,751
Denmark	0	18,676	0	14,858	0	9,873	0	14,856	0	40,162
Irish Free State	124	16,159	142	17,536	61	16,007	63	20,679	44	28,033
Canada	58	13,645	98	14,815	34	14,010	42	9,819	113	8,701
Spain	0	13,003	0	12,450	0	9,915	0	5,176	2	10,617
Czechoslovakia	5	12,088	1	10,579	2	9,035	3	16,868	2	24,818
Austria	20	6,593	21	5,338	30	7,160	17	8,214	6	14,287
Sweden		5,112		5,533		3,853		8,146		13,535
Switzerland	0	5,099	0	5,370	0	4,297	2	5,202	6	7,117
Norway		4,588		3,642		4,575		6,101		7,556
Cuba	0	[4] 2,315	0	1,154	0		0		0	
Mexico [6]	[4] 3	[4] 2,108	0	393		311	0	3,122	0	737
Poland	22	2,008	15	1,144	8	636	0	862	1	421
Japan	0	[4] 1,702	0	1,588	0	2,532	0	2,778	0	3,348
Greece	0	886	0	1,145	0	380	0	540	0	6,105
Australia	91	602	272	22	3	81	2	4		
Tunis	17	424	17	1	13	1	14	647	0	634
Algeria	14	214	14	106	11	61	4	183	27	427
Finland	0	190	0	293	0	262	0	346	0	941
Estonia	0	66	0	292	0	0	0	0	0	0
Total	4,818	340,036	4,743	336,684	4,676	304,789	5,338	342,194	7,033	498,907

Bureau of Agricultural Economics, official sources except where otherwise noted. Maicena or maizena is included with "corn and corn meal."

[1] Preliminary.
[2] 1 year only.
[3] Monthly Crop Report and Agricultural Statistics.
[4] 4-year average.
[5] 3-year average.
[6] Calendar year.

TABLE 48.—*Corn: Estimated average price per bushel, received by producers, United States, 1923–24 to 1932–33*

Crop year	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	84.8	78.3	72.2	73.6	76.5	77.2	78.2	78.6	80.8	98.3	107.4	109.7	82.3
1924–25	108.9	99.6	105.6	112.0	114.5	112.1	103.8	107.5	111.0	104.4	106.5	98.8	107.3
1925–26	83.0	74.6	70.7	69.6	68.5	66.6	65.7	67.1	68.6	71.5	79.5	76.2	71.4
1926–27	74.5	66.0	64.5	64.3	66.5	65.2	65.6	73.0	88.9	92.4	97.7	95.3	74.1
1927–28	87.6	73.7	75.1	75.2	79.0	86.2	91.9	102.5	102.2	102.4	98.2	95.1	85.3
1928–29	84.7	75.4	76.1	80.2	86.8	88.7	87.5	86.2	86.9	91.2	95.9	97.2	84.5
1929–30	91.9	81.0	78.0	77.3	77.4	74.5	78.3	77.7	79.0	77.1	90.0	91.7	80.9
1930–31	81.9	66.3	64.9	61.7	58.6	57.5	57.7	56.3	53.8	54.0	50.8	43.2	60.2
1931–32	38.4	36.6	34.5	33.7	32.4	32.2	31.4	30.1	29.4	29.9	30.2	28.0	32.1
1932–33	21.6	19.4	18.8		•								

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on first of month and first of succeeding month, October, 1922–December, 1923.

TABLE 49.—*Corn: Weighted average price*[1] *per bushel of reported cash sales, Chicago, Kansas City, and 6 markets combined, 1923–24 to 1932–33*

Grade, market, and crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted average
No. 3 Yellow, Chicago:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	82	71	76	78	77	77	77	82	109	117	114	110	88
1924–25	111	120	124	122	117	105	115	113	108	102	91	82	100
1925–26	83	76	79	75	72	71	71	70	78	80	79	77	75
1926–27	71	75	74	73	68	71	87	99	102	109	97	84	87
1927–28	84	86	89	95	99	106	108	103	106	102	100	96	101
1928–29	84	83	93	94	94	90	87	91	99	101	101	95	92
1929–30	88	88	85	82	80	82	79	79	82	99	94	82	83
1930–31	71	69	65	61	60	58	56	58	57	46	42	38	60
1931–32	43	37	37	34	33	32	31	30	32	32	30	26	36
1932–33	25	23	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
No. 3 Yellow, Kansas City:													
1923–24	78	67	73	73	72	76	75	86	104	109	110	108	78
1924–25	107	115	121	115	111	101	110	108	108	102	91	82	112
1925–26	75	74	75	70	67	69	71	72	81	83	80	77	74
1926–27	74	75	74	72	73	73	91	97	103	105	96	83	88
1927–28	79	78	81	86	91	97	105	102	100	94	94	86	85
1928–29	82	79	87	87	88	85	85	88	93	99	99	92	85
1929–30	87	84	82	78	76	80	78	80	80	92	89	82	80
1930–31	69	66	59	54	54	53	52	52	53	45	40	40	55
1931–32	46	39	39	36	34	34	34	33	35	33	29	24	37
1932–33	24	22	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
6 markets, all classes and grades:[2]													
1923–24	74.9	67.5	72.8	73.7	72.7	74.7	75.4	82.7	106.6	114.4	113.7	109.2	83.0
1924–25	108.3	114.4	112.9	108.6	103.5	99.0	111.9	109.7	105.3	101.3	89.1	80.8	106.0
1925–26	71.0	68.3	69.5	63.2	64.6	66.4	68.0	66.9	76.3	78.3	76.5	73.2	69.0
1926–27	67.3	65.9	65.2	62.7	60.9	67.0	83.0	91.5	96.7	104.2	92.2	79.9	75.8
1927–28	78.7	77.0	78.6	84.1	89.6	98.2	104.0	100.8	102.7	96.8	97.5	89.3	89.2
1928–29	79.8	78.4	87.1	89.5	89.0	86.0	84.6	89.7	98.1	99.9	100.0	93.8	88.5
1929–30	81.0	79.1	77.7	75.9	73.5	80.2	78.5	77.8	80.6	97.6	93.2	80.3	80.3
1930–31	67.8	64.1	61.0	57.2	56.8	56.3	54.4	55.3	56.9	46.7	42.4	38.0	56.9
1931–32	43.5	37.1	37.0	34.2	93.1	32.6	31.9	30.7	32.4	32.1	29.8	25.6	33.2
1932–33	24.8	22.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin and Kansas City Grain Market Review.

[1] Average of daily prices weighted by car-lot sales.

[2] Compiled from daily trade papers of markets named. The markets are Chicago, St. Louis, Omaha, Kansas City, Minneapolis, and Cincinnati (not included November, 1928–December, 1932). The prices in this section of the table are comparable with prices paid to producers in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

TABLE 50.—*Corn: Volume of trading in futures in all contract markets, by months, 1924–25 to 1932–33*

Month	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32	1932–33
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
November	557	317	383	473	457	261	418	361	145
December	707	514	395	681	420	199	649	209	99
January	710	302	261	511	690	196	600	119	-----
February	677	236	288	698	373	252	474	156	-----
March	810	317	429	733	416	328	370	142	-----
April	670	292	313	745	466	283	380	204	-----
May	510	237	692	699	526	290	340	110	-----
June	566	343	921	567	475	322	265	102	-----
July	463	448	575	553	520	498	381	98	-----
August	394	439	713	616	453	611	373	178	-----
September	442	368	836	372	296	433	238	122	-----
October	335	340	588	467	269	461	246	106	-----
Total	6,841	4,153	6,394	7,115	5,361	4,134	4,740	1,907	-----

Grain Futures Administration.

Table 51.—*Corn, yellow, La Plata: Spot price per bushel of 56 pounds at Liverpool and Buenos Aires, 1923–24 to 1932–33*

BUENOS AIRES

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	77	79	78	82	77	68	65	64	76	85	93	105	79
1924–25	106	107	112	108	96	92	100	92	93	96	91	83	98
1925–26	84	86	78	73	66	70	68	68	68	70	65	60	71
1926–27	56	55	60	63	62	60	63	69	70	76	77	76	66
1927–28	75	83	90	97	102	89	90	91	90	86	87	95	90
1928–29	96	93	97	96	90	85	79	81	81	87	87	84	88
1929–30	74	72	65	62	59	62	60	56	54	56	51	43	60
1930–31	34	33	29	31	35	30	30	30	30	26	24	25	30
1931–32	32	28	27	29	32	30	30	30	32	32	32	30	30
1932–33	28	26											

LIVERPOOL

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
1923–24	96	102	103	115	111	107	112	100	94	104	114	124	107
1924–25	121	122	131	129	114	115	131	128	127	138	120	103	123
1925–26	107	110	97	91	89	94	91	87	100	98	90	93	96
1926–27	95	92	89	93	87	88	94	91	91	98	97	96	93
1927–28	97	104	110	119	127	129	127	125	130	119	107	116	117
1928–29	123	120	125	127	124	120	107	104	118	113	107	103	116
1929–30	96	89	84	79	75	91	85	76	84	90	77	63	82
1930–31	52	54	48	49	58	62	57	50	47	44	41	40	50
1931–32	44	37	39	42	46	47	46	42	43	43	42	39	42
1932–33	37	37											

Bureau of Agricultural Economics. Compiled from Broomhall's Corn Trade News and Review of the River Plate. Average of weekly quotations. Conversions of Liverpool prices at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive, subsequently at par of exchange, except that, beginning with September, 1931, the monthly average of current rates of exchange was used. Buenos Aires prices are averages of weekly quotations, converted at monthly average rate of exchange as given in the Federal Reserve Bulletin.

Table 52.—*Corn: Volume of trading in futures at contract markets, by markets, and by crop years for period 1927–28 to 1931–32 and monthly for period November 1, 1931–December 31, 1932*

Year and month	Chicago Board of Trade	Chicago open board	Kansas City	St. Louis	Milwaukee	Minneapolis	Omaha
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1927–28	6,589	175	290	23	39		
1928–29	4,924	144	247	12	33		
1929–30	3,799	95	208	5	27		
1930–31	4,318	173	209	3	24	9,869	
1931–32	1,796	43	57	1	9		1
1931							
November	337	8	14	½	2		⅛
December	194	5	8	¼	1		⅛
1932							
January	111	4	4	⅛	½		
February	145	4	7	⅛	½		
March	134	4	4		½		⅛
April	192	4	6	⅛	1		¼
May	103	2	3		¾		⅛
June	96	2	3		½		⅛
July	93	2	3		½		
August	172	3	3		¾		⅛
September	117	2	2		½		
October	101	2	2		½		
November	139	2	3		½		
December	93	2	3		¼		

Grain Futures Administration.

TABLE 53.—*Oats: Acreage, production, value, exports, etc., United States, 1900–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Price per bushel at Chicago, year beginning Aug. 1 [1]	Foreign trade, including meal, year beginning July [2]: Domestic exports	Foreign trade: Imports	Foreign trade: Net exports [3]: Total	Foreign trade: Net exports [3]: Percentage of production
	1,000 acres	*Bushels of 32 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1900	30,290	30.2	913,800	25.4	232,074	26	42,269	32	42,237	4.8
1901	29,804	26.0	778,392	39.7	308,796	43	13,278	39	13,240	1.7
1902	30,578	34.5	1,053,489	30.6	322,423	34	8,382	150	8,233	.8
1903	30,866	28.2	869,350	34.0	295,232	38	1,961	184	1,857	.2
1904	31,353	32.2	1,008,931	31.1	313,488	32	8,395	56	8,339	.8
1905	32,072	34.0	1,090,736	28.9	314,868	31	48,435	40	48,395	4.4
1906	33,353	31.0	1,035,576	31.9	329,853	37	6,386	91	6,379	.6
1907	33,641	23.9	805,108	44.5	358,421	50	2,519	383	2,195	.3
1908	34,006	25.0	850,540	47.3	402,010	52	2,334	6,092	[4] 4,252	---
1909	*35,159*	*28.6*	*1,007,143*							
1909	35,159	30.4	1,068,289	40.6	433,869	42	2,549	1,063	1,704	.2
1910	37,548	31.6	1,186,341	34.4	408,388	33	3,846	140	3,707	.3
1911	37,763	24.4	922,298	45.0	414,663	50	2,678	2,660	30	(5)
1912	37,917	37.4	1,418,337	31.9	452,469	35	36,455	766	35,695	2.5
1913	38,399	29.2	1,121,768	39.2	439,596	40	2,749	22,333	[4] 18,858	---
1914	38,442	29.7	1,141,060	43.8	499,431	50	100,609	670	100,158	8.8
1915	40,996	37.8	1,549,030	36.1	559,506	41	98,960	720	98,648	6.4
1916	41,527	30.1	1,251,837	52.4	655,928	54	95,106	841	94,348	7.5
1917	43,553	36.6	1,592,740	66.6	1,061,474	71	125,091	2,916	122,273	7.7
1918	44,349	34.7	1,538,124	70.9	1,090,322	70	109,005	838	108,167	7.0
1919	*37,991*	*27.8*	*1,055,183*							
1919	39,599	27.9	1,106,426	70.2	777,064	80	43,436	6,077	37,365	3.4
1920	42,726	33.8	1,445,936	45.6	658,737	51	9,391	3,827	5,831	.4
1921	45,537	23.0	1,045,174	29.8	311,268	35	21,237	1,824	19,422	1.8
1922	40,324	28.5	1,147,720	39.0	447,277	41	25,413	340	25,087	2.2
1923	40,245	30.5	1,227,139	40.8	500,282	45	8,796	4,271	4,550	.4
1924	*37,650*	*34.7*	*1,304,599*							
1924	41,811	34.0	1,423,317	47.6	677,550	50	16,777	3,067	13,926	1.0
1925	44,250	31.9	1,410,184	37.4	527,847	41	39,687	212	39,565	2.8
1926	42,861	26.6	1,141,945	39.2	447,710	43	15,041	135	14,988	1.3
1927	40,326	27.1	1,092,550	44.3	484,253	55	9,823	233	9,611	.9
1928	40,079	32.9	1,317,640	40.3	530,587	44	16,251	426	15,825	1.2
1929	*33,466*	*29.7*	*992,747*							
1929	38,148	29.3	1,118,414	[6] 41.9	[7] 468,369	44	7,986	175	7,791	.7
1930	39,597	32.2	1,276,035	[6] 32.2	[7] 410,586	35	3,123	659	2,464	.2
1931	39,800	28.1	1,117,970	[6] 21.3	[7] 238,279	22	4,437	85	4,352	.4
1932 [8]	41,224	30.1	1,242,437	[6] 14.1	[7] 175,207	---	---	---	---	---

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. See 1927 Yearbook, p. 788, for data for earlier years.

1 From Chicago Daily Trade Bulletin, averages of the daily cash quotations of No. 3 white oats weighted by car-lot sales.

2 Compiled from Commerce and Navigation of the United States, 1900–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932; and official records of the Bureau of Foreign and Domestic Commerce. Oats—general imports, 1900–1932; oatmeal—general imports, 1900–1909; imports for consumption, 1910–1932.

3 Total exports (domestic plus foreign) minus total imports.

4 Net imports. Total imports minus total exports (domestic plus foreign).

5 Less than 0.05 per cent.

6 Weighted average price for crop marketing season.

7 Based on weighted average price for crop marketing season.

8 Preliminary.

TABLE 54.—*Oats: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932[1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Maine	125	118	130	36.3	32.0	38.0	4,646	3,776	4,940	41	33
New Hampshire	10	6	6	37.7	38.0	39.0	394	228	234	45	36
Vermont	71	61	62	30.4	32.0	33.0	2,217	1,952	2,046	39	32
Massachusetts	7	4	5	31.8	33.0	33.0	236	132	165	41	37
Rhode Island	2	2	2	32.8	31.0	34.0	71	62	68	40	38
Connecticut	11	8	9	29.2	29.0	31.0	313	232	279	40	39
New York	930	863	872	29.8	28.5	31.0	29,987	24,596	27,032	32	27
New Jersey	46	43	41	26.6	31.0	26.0	1,262	1,333	1,066	33	29
Pennsylvania	1,025	954	944	30.2	29.5	25.5	32,532	28,143	24,072	32	26
North Atlantic	2,226	2,059	2,071	30.4	29.4	28.9	71,658	60,454	59,902	32.9	28.2
Ohio	1,960	1,657	1,591	35.0	37.5	28.5	75,086	62,138	45,344	20	16
Indiana	1,998	1,946	1,965	30.0	31.2	30.0	62,818	60,715	58,950	17	13
Illinois	4,477	4,182	4,307	32.0	34.5	37.5	144,486	144,279	161,512	17	12
Michigan	1,537	1,435	1,263	31.0	30.5	27.0	51,200	43,768	34,101	23	18
Wisconsin	2,537	2,459	2,533	35.2	28.0	35.0	94,993	68,852	88,655	27	19
Minnesota	4,466	4,575	4,575	32.6	27.0	36.0	153,293	123,525	164,700	19	11
Iowa	6,188	6,120	6,212	35.3	31.0	36.0	223,326	189,720	223,632	19	11
Missouri	1,727	1,865	1,809	20.1	27.0	19.0	34,160	50,355	34,371	22	16
North Dakota	2,191	1,498	2,112	23.1	12.2	21.0	54,599	18,276	44,352	15	7.4
South Dakota	2,611	1,745	2,321	28.0	11.5	32.5	72,267	20,068	75,432	20	8.4
Nebraska	2,514	2,311	2,473	27.2	21.5	30.0	65,398	49,686	74,190	22	12
Kansas	1,414	1,561	1,608	22.1	28.0	21.5	30,487	43,708	34,572	19	14
North Central	33,620	31,354	32,769	30.7	27.9	31.7	1,062,113	875,090	1,039,811	19.7	12.4
Delaware	3	3	4	26.7	35.0	26.0	85	105	104	36	29
Maryland	53	67	57	27.4	30.0	25.0	1,508	2,010	1,425	32	29
Virginia	147	189	166	19.2	25.6	19.5	2,971	4,838	3,237	37	30
West Virginia	153	148	138	23.7	24.0	22.0	3,783	3,552	3,036	37	32
North Carolina	184	197	205	15.8	23.0	18.0	2,756	4,531	3,690	38	35
South Carolina	357	378	389	21.7	25.0	20.5	7,327	9,450	7,974	37	33
Georgia	285	332	378	17.6	24.0	18.5	5,028	7,968	6,993	44	36
Florida	10	9	7	13.3	18.0	11.5	131	162	80	52	37
South Atlantic	1,191	1,323	1,344	19.9	24.7	19.7	23,591	32,616	26,539	38.6	33.4
Kentucky	189	232	162	17.8	22.0	14.5	3,516	5,104	2,349	33	24
Tennessee	144	138	124	17.0	20.0	15.4	2,531	2,760	1,910	33	29
Alabama	97	153	99	17.0	22.0	15.0	1,625	3,366	1,485	39	33
Mississippi	38	50	32	18.7	26.5	16.0	707	1,325	512	37	31
Arkansas	161	160	114	19.0	26.0	14.0	2,889	4,160	1,596	27	23
Louisiana	14	26	20	21.4	29.0	15.0	312	754	300	33	29
Oklahoma	1,160	1,516	1,334	21.0	28.5	18.0	23,679	43,206	24,012	18	12
Texas	1,423	1,732	1,749	25.0	34.0	24.0	35,892	58,888	41,976	19	13
South Central	3,225	4,007	3,634	22.1	29.8	20.4	71,151	119,563	74,140	20.7	14.2
Montana	466	183	403	28.2	17.5	25.0	13,552	3,202	10,075	30	21
Idaho	137	106	148	33.4	27.0	37.0	4,635	2,862	5,476	25	20
Wyoming	139	83	141	26.0	21.5	21.0	3,815	1,784	2,961	34	23
Colorado	203	142	141	27.9	24.0	24.0	5,506	3,408	3,384	27	21
New Mexico	40	38	40	20.8	30.0	23.0	782	1,140	920	26	24
Arizona	11	12	13	26.5	30.0	28.0	309	360	364	36	33
Utah	51	43	54	34.1	30.0	34.0	1,811	1,290	1,836	38	29
Nevada	2	2	3	36.8	25.0	38.0	71	50	114	46	33
Washington	170	158	166	45.4	49.0	50.0	7,560	7,742	8,300	26	25
Oregon	278	223	223	28.9	32.0	30.5	7,879	7,136	6,802	27	28
California	106	67	74	25.1	19.0	24.5	2,696	1,273	1,813	35	29
Western	1,603	1,057	1,406	30.4	28.6	29.9	48,615	30,247	42,045	28.2	23.8
United States	41,866	39,800	41,224	29.6	28.1	30.1	1,277,127	1,117,970	1,242,437	21.3	14.1

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

Table 55.—*Oats: World production, 1894–95 to 1932–33*

Crop year	Estimated world production, excluding Russia and China	Estimated European production, excluding Russia	Selected countries							
			United States	Russia [1]	Germany	Canada	France	Poland	England and Wales	Argentina
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1894–95	2,251	1,453	662	683	453	-------	294	-------	119	-------
1895–96	2,443	1,434	824	717	430	-------	306	-------	105	-------
1896–97	2,249	1,378	707	800	411	-------	296	-------	93	-------
1897–98	2,141	1,283	699	664	394	-------	253	-------	99	1
1898–99	2,391	1,513	731	688	465	-------	322	-------	102	1
1899–1900	2,505	1,464	796	995	474	-------	308	-------	99	2
1900–1	2,624	1,454	914	854	489	-------	285	-------	99	2
1901–2	2,344	1,415	778	624	486	-------	255	-------	91	2
1902–3	2,888	1,570	1,053	931	514	-------	320	-------	115	4
1903–4	2,829	1,649	869	800	542	-------	344	-------	100	3
1904–5	2,711	1,430	1,009	1,124	478	-------	291	-------	112	4
1905–6	2,818	1,455	1,090	937	451	-------	306	-------	99	6
1906–7	3,007	1,683	1,036	714	581	-------	295	-------	109	12
1907–8	2,856	1,763	805	921	630	-------	353	-------	121	34
1908–9	2,826	1,626	851	959	530	266	327	-------	106	32
1909–10	3,418	1,865	1,068	1,163	629	376	383	-------	104	36
1910–11	3,225	1,662	1,186	1,065	544	259	332	-------	104	47
1911–12	3,137	1,685	922	876	531	388	349	-------	96	69
1912–13	*3,702*	*1,722*	*1,418*	*1,089*	*587*	*416*	355	-------	*89*	76
1913–14	3,582	1,912	1,122	1,251	669	430	357	-------	91	43
1914–15	3,268	1,683	1,141	[2] 915	623	333	318	-------	93	49
1915–16	3,596	1,403	1,549	[3] 897	412	494	239	-------	101	75
1916–17	3,261	1,471	1,252	[4] 845	484	436	277	-------	102	32
1917–18	3,219	1,049	1,593	761	[5] 250	428	[5] 220	-------	106	69
1918–19	3,218	1,120	1,538	-------	302	453	181	-------	141	34
1919–20	2,963	1,320	1,106	-------	310	419	180	76	110	31
1920–21	3,597	1,478	1,446	486	332	564	291	129	103	51
1921–22	3,072	1,454	1,045	359	345	453	244	92	100	31
1922–23	3,275	1,473	1,148	409	277	522	288	110	88	56
1923–24	3,714	1,722	1,227	405	421	599	337	153	95	76
1924–25	3,573	1,572	1,423	603	390	431	306	106	105	53
1925–26	3,712	1,709	1,410	838	385	427	328	144	97	80
1926–27	3,534	1,843	1,142	1,071	430	407	364	134	104	66
1927–28	3,436	1,748	1,093	917	437	467	343	147	94	52
1928–29	3,828	1,879	1,318	1,135	482	480	340	172	101	65
1929–30	3,646	2,060	1,118	1,084	509	301	373	203	107	68
1930–31	*3,588*	*1,710*	*1,276*	*1,145*	390	*450*	286	*162*	*94*	*61*
1931–32	3,317	1,698	1,118	-------	427	349	316	159	87	69
1932–33 [6]	3,688	1,860	1,242	-------	458	420	353	164	88	86

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends in 1932.

[1] Includes all Russian territory reporting for the years shown.
[2] Total Russian Empire, exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and the Provinces of Batum and Elizabetpol, in Transcaucasia.
[4] Beginning this year, estimates for the present territory of the Union of Socialist Soviet Republics, exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924–25 produced 20,248,000 bushels.
[5] Beginning with this year post-war boundaries and therefore not comparable with earlier years.
[6] Preliminary.

TABLE 56.—*Oats: Acreage, yield per acre, and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Acreage					Yield per acre					Production				
	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	[1] 1932–33	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	[1] 1932–33	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	[1] 1932–33
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
North America:															
Canada	14, 585	12, 479	13, 259	12, 871	13, 149	33. 4	24. 1	33. 9	27. 1	31. 9	486, 570	300, 516	449, 595	348, 795	419, 556
United States	42, 433	38, 148	39, 597	39, 800	41, 224	29. 5	29. 3	32. 2	28. 1	30. 1	1, 250, 707	1, 118, 414	1, 276, 035	1, 117, 970	1, 242, 437
Total	57, 018	50, 627	52, 856	52, 671	54, 373	30. 5	28. 0	32. 6	27. 8	30. 6	1, 737, 277	1, 418, 930	1, 725, 630	1, 466, 765	1, 661, 993
Europe:															
England and Wales	2, 039	1, 854	1, 778	1, 652	1, 580	47. 5	57. 8	52. 8	52. 5	55. 4	96, 796	107, 240	93, 902	86, 751	87, 563
Scotland	970	889	862	835	867	49. 0	59. 4	52. 5	52. 1	60. 2	47, 563	52, 850	45, 290	43, 540	52, 220
Irish Free State	736	666	644	623	623	49. 3	72. 5	68. 7	58. 5		36, 310	48, 257	44, 250	36, 457	
Northern Ireland	344	314	307	286	286	54. 0	63. 9	63. 2	55. 3		18, 582	20, 072	19, 403	15, 827	
Norway	274	239	239	237	235	41. 6	50. 8	57. 0	40. 1	56. 5	11, 406	12, 146	13, 621	9, 494	13, 282
Sweden	1, 807	1, 748	1, 631	1, 590	1, 577	41. 7	49. 2	47. 3	43. 9	49. 1	75, 374	86, 067	77, 211	69, 766	77, 505
Denmark	1, 118	979	958	937	983	54. 2	72. 8	71. 7	68. 8		60, 542	71, 276	68, 725	64, 448	
Netherlands	380	396	370	369	350	54. 9	65. 1	55. 3	53. 6	59. 8	20, 850	25, 776	20, 454	19, 784	20, 916
Belgium	656	744	674	729	714	62. 4	69. 2	56. 7	66. 4	66. 9	40, 954	51, 487	38, 223	48, 384	47, 790
Luxemburg	70	77	70	75	74	30. 4	47. 0	39. 3	36. 3	47. 5	2, 130	3, 617	2, 750	2, 721	3, 514
France	8, 521	8, 510	8, 460	8, 563	8, 427	35. 3	43. 8	33. 8	36. 9	41. 9	300, 569	373, 142	285, 953	316, 286	353, 381
Spain	1, 623	1, 839	1, 940	1, 986	1, 926	22. 3	24. 9	25. 8	21. 0	27. 8	36, 175	45, 812	49, 995	41, 670	53, 639
Portugal	563	432	429	422		11. 4	12. 9	18. 1	15. 0		6, 422	5, 571	7, 778	6, 331	7, 355
Italy	1, 189	1, 293	1, 262	1, 146	1, 113	31. 9	37. 3	29. 2	34. 4	37. 6	37, 806	48, 261	36, 828	39, 467	41, 805
Switzerland	51	50	49	45	41	54. 7	57. 9	54. 3	51. 3	57. 1	2, 788	2, 894	2, 659	2, 308	2, 342
Germany	8, 246	8, 793	8, 499	8, 310	8, 116	44. 1	57. 8	45. 9	51. 4	56. 4	363, 278	508, 633	389, 688	427, 479	458, 143
Austria	739	733	772	777	784	30. 5	42. 4	35. 8	29. 4	39. 9	22, 556	31, 074	27, 606	22, 876	31, 312
Czechoslovakia	2, 039	2, 143	2, 034	2, 031	2, 020	40. 2	48. 0	44. 3	41. 5	56. 7	82, 029	102, 927	90, 100	84, 368	114, 627
Hungary	785	745	608	596	575	28. 8	38. 0	29. 6	22. 4	33. 9	22, 644	28, 292	17, 998	13, 868	19, 510
Yugoslavia	923	953	1, 009	974	810	22. 4	25. 4	19. 5	18. 7	22. 9	20, 644	24, 166	19, 634	18, 242	18, 548
Greece	206	253	339	344		20. 3	16. 5	17. 4	15. 3		4, 187	4, 179	5, 891	5, 274	6, 200
Bulgaria	362	383	345	295	281	19. 6	24. 3	22. 1	29. 2	27. 7	7, 100	9, 434	7, 616	8, 605	7, 777
Rumania	3, 133	2, 997	2, 686	2, 153	1, 956	20. 1	31. 2	29. 7	21. 4	26. 9	62, 819	93, 647	79, 078	46, 175	52, 538
Poland	4, 446	5, 415	5, 404	5, 367	5, 478	27. 2	37. 6	29. 9	29. 6	29. 9	120, 813	203, 450	161, 736	159, 108	163, 962
Lithuania	842	845	908	900	919	27. 4	35. 8	29. 6	31. 2	27. 1	23, 078	30, 233	26, 871	28, 065	24, 940
Latvia	740	749	790	795	802	24. 6	31. 3	29. 8	29. 7	27. 1	18, 206	23, 433	23, 537	23, 611	21, 714
Estonia	[3] 390	371	368	367	356	[3] 23. 3	27. 7	29. 5	30. 8	24. 5	9, 505	10, 277	10, 870	11, 296	8, 722

Finland	1,058	1,071	1,137	1,149	1,119	32.6	33.1	36.5	40.2	40.7	34,529	35,403	41,458	46,138	45,539
Russia, European and Asiatic	25,776	46,654	42,427	42,495	38,679	20.3	23.2	27.0			522,905	1,084,337	1,145,353		
Total Europe reporting area and production, all years	41,283	42,842	41,895	40,941	40,120	35.4	44.6	37.3	38.3	42.9	1,459,702	1,910,261	1,563,678	1,569,502	1,721,289
Estimated European total, excluding Russia	44,300	45,500	44,600	43,600	42,800						1,585,000	2,060,000	1,710,000	1,698,000	1,860,000
Africa:															
Morocco	35	116	103	60	63	18.4	29.4	22.9	27.7	25.3	645	3,413	2,357	1,660	1,591
Algeria	605	639	635	557	504	21.0	23.1	26.1	14.7	13.6	12,713	14,785	16,561	8,212	6,855
Tunis	126	133	124	67	86	19.4	25.9	16.7	33.9	22.4	2,439	3,445	2,067	2,274	1,929
Total	766	888	862	684	653	20.6	24.4	24.3	17.8	15.9	15,797	21,643	20,985	12,146	10,375
Asia:															
Turkey	[3] 216	426	374			[4] 47.5	23.6	26.7			[4] 11,391	10,039	10,000		8,405
Syria and Lebanon	[2] 26	28	28	27	28	[2] 16.7	25.6	19.5	26.3	33.4	[2] 435	718	547	711	934
Japan	278	289	297	292		39.0	38.2	42.3	37.9		10,847	11,045	12,558	11,061	
Chosen	276	270	270	306		16.5	16.2	16.0	16.8		4,545	4,370	4,311	5,138	
Total Northern Hemisphere reporting area and production, all years	99,093	94,385	95,641	94,323	95,174	32.4	35.5	34.6	32.3	35.7	3,213,211	3,351,552	3,310,840	3,049,124	3,394,591
Estimated Northern Hemisphere total, excluding Russia and China	102,900	98,100	99,300	97,800	98,700						3,368,000	3,528,000	3,485,000	3,206,000	3,559,000
SOUTHERN HEMISPHERE															
Brazil	16					30.1					482	507			
Chile	106	297	193	166	171	37.3	35.0	26.5	29.7		3,954	10,400	5,109	4,923	
Uruguay	120	206	103	148	135	18.0	18.8	13.4	21.0		2,166	3,877	1,376	3,107	
Argentina	1,824	2,160	2,051	[5] 3,470	[5] 3,652	32.5	31.6	29.7	[6] 20.0	[6] 23.6	59,286	68,293	60,983	69,280	86,117
Union of South Africa	645	687	535	578		10.3	13.7	11.1			6,624	9,420	5,920		
Australia	1,000	1,516	1,082	1,111		19.0	11.9	19.2	18.2		19,010	18,030	20,823	20,188	
New Zealand	125	68	87	69		48.0	53.8	47.3	49.8		5,996	3,659	4,115	3,435	
Total Northern and Southern Hemisphere countries reporting area and production, all years	100,917	96,545	97,692	97,793	98,826	32.4	35.4	34.5	31.9	35.2	3,272,497	3,419,845	3,371,823	3,118,404	3,480,708
Estimated world total, excluding Russia and China	106,800	103,100	103,500	102,200	103,700						3,409,000	3,646,000	3,588,000	3,317,000	3,688,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends early in 1932.

[1] Preliminary. [2] 4-year average. [3] 2-year average. [4] 1 year only. [5] Acreage sown. [6] Yield per acre sown.

TABLE 57.—*Oats: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning June	Percentage of receipts during —													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1922–23	.2	8.7	14.4	11.9	10.8	8.4	8.5	8.1	7.0	6.6	5.0	5.3	5.1	100
1923–24	.6	7.2	10.2	12.8	11.4	7.5	8.0	7.9	7.8	5.9	4.9	5.1	4.7	100
1924–25	.2	6.8	18.3	18.3	12.6	7.7	8.3	7.7	4.8	3.3	2.7	4.9	4.4	100
1925–26	.2	9.6	20.0	13.5	10.9	7.4	7.0	6.0	6.2	5.3	4.3	4.6	5.0	100
1926–27	1.3	11.4	20.4	12.4	9.1	6.5	6.7	6.6	6.2	5.9	4.4	5.0	4.1	100
1927–28	1.4	8.4	21.7	14.5	10.3	6.6	6.6	6.3	6.5	6.0	3.9	4.4	3.4	100
1928–29	1.1	6.8	23.7	13.5	10.2	6.5	7.5	5.4	6.6	5.0	4.8	4.1	4.8	100
1929–30	1.0	11.3	30.2	12.8	8.7	5.4	5.1	4.2	4.4	4.4	4.8	4.3	3.4	100
1930–31	1.4	12.6	27.5	13.2	8.7	4.4	5.0	4.4	5.5	4.5	5.0	3.8	4.0	100
1931–32	3.3	15.2	21.5	11.3	7.5	5.6	5.6	5.6	5.5	5.2	5.3	4.9	3.5	100

Bureau of Agricultural Economics.

TABLE 58.—*Oats: Receipts graded by licensed inspectors, all inspection points, total of all classes under each grade, 1922–23 to 1931–32*

Year beginning August	Grade					
	No. 1	No. 2	No. 3	No. 4	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1922–23	2,548	47,348	95,984	17,004	4,640	167,524
1923–24	2,724	41,530	90,759	22,643	11,307	168,963
1924–25	1,489	33,631	110,377	24,580	14,853	184,930
1925–26	2,197	53,587	75,634	17,989	6,260	155,667
1926–27	1,465	19,692	49,581	28,548	17,695	116,981
1927–28	2,838	29,106	64,444	19,397	5,728	121,513
1928–29	4,408	14,144	77,823	20,684	9,305	126,364
1929–30	4,106	26,053	71,757	11,822	3,097	116,835
1930–31	10,344	36,939	35,186	8,137	983	91,589
1931–32	1,394	21,966	40,303	4,059	926	68,648

Bureau of Agricultural Economics. 1 car equivalent to 1,500 bushels.

TABLE 59.—*Oats: Stocks of old oats on farms August 1 and March 1, by geographic divisions and United States, 1923–1932*

Year	Stock on farms Mar. 1, United States	Stocks on farms Aug. 1						
		North Atlantic	East North Central	West North Central	South Atlantic	South Central	Western	United States
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1923	400,862	4,216	17,343	42,534	578	1,212	1,852	67,735
1924	425,430	3,947	17,290	36,708	570	1,389	2,735	62,639
1925	511,954	4,724	27,578	49,774	369	1,732	1,762	85,939
1926	545,990	5,751	35,107	59,437	480	496	2,327	103,598
1927	391,527	5,552	23,335	24,068	488	2,698	1,255	57,396
1928	347,400	4,019	11,359	20,272	341	1,069	2,112	39,172
1929	460,703	4,142	30,894	41,813	328	1,192	2,155	80,524
1930	368,356	2,843	17,134	38,573	699	885	2,246	62,380
1931	429,497	6,244	22,297	40,438	502	1,120	1,983	72,584
1932	374,182	4,557	25,165	23,850	1,112	10,704	871	66,265

Bureau of Agricultural Economics. Compiled from estimates which are based on percentages of crop on farms as estimated by crop reporters.

TABLE 60.—*Oats: Commercial stocks, 1926–27 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
DOMESTIC OATS IN UNITED STATES [1]												
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27						47, 123	47, 421	45, 105	38, 481	30, 513	22, 553	17, 686
1927–28	11, 886	23, 224	26, 513	25, 682	24, 784	23, 815	20, 006	21, 127	16, 803	11, 667	7, 171	3, 338
1928–29	1, 939	15, 992	17, 561	16, 900	15, 399	17, 314	16, 219	16, 800	14, 003	11, 493	10, 591	8, 592
1929–30	8, 668	24, 318	28, 597	32, 762	30, 064	29, 568	26, 097	22, 937	19, 484	16, 519	13, 247	11, 028
1930–31	9, 102	25, 844	32, 904	33, 265	30, 504	30, 896	26, 770	23, 029	19, 055	13, 930	9, 081	8, 042
1931–32	8, 021	15, 013	17, 372	18, 180	18, 161	16, 810	17, 096	17, 938	15, 796	13, 621	11, 272	10, 657
1932–33	12, 627	27, 273	28, 895	29, 084	27, 484							
UNITED STATES OATS IN CANADA												
1926–27						352	247	218	164	635	1, 432	1, 759
1927–28	1, 253	1, 238	1, 435	1, 110	825	670	563	428	216	57	239	60
1928–29	4	978	2, 326	1, 031	547	644	494	424	309	716	529	346
1929–30	334	2, 177	4, 711	4, 435	4, 410	3, 735	3, 236	2, 852	2, 407	1, 934	1, 580	936
1930–31	1, 106	2, 679	2, 524	2, 425	2, 103	1, 475	1, 110	834	640	821	936	584
1931–32	207	110	199	230	467	165	11	2	0	73	226	126
1932–33	144	1, 317	1, 530	1, 407	1, 151							
CANADIAN OATS IN UNITED STATES [2]												
1926–27						228	228	171	66	117	321	19
1927–28	24	26	0	139	296	609	312	247	117	21	199	122
1928–29	101	123	141	211	711	900	704	801	516	722	577	377
1929–30	341	341	283	426	670	699	634	615	488	330	264	91
1930–31	146	21	55	27	7	256	167	3	17	78	238	73
1931–32	13	41	41	41	32	32	2	2	1	1	0	0
1932–33	0	0	0	0	0							

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the 1st day of the month.

[1] Includes oats in store in public and private elevators in 42 important markets and also the oats afloat in vessels or barges in the harbors of lake and seaboard ports. Oats in transit either by rail or water, mill stocks, or small private stocks of oats intended only for local purposes, not included.

[2] Includes oats stored at lake and seaboard ports, exclusive of oats in transit on lakes and canals.

TABLE 61.—*Oats: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	40. 2	37. 6	38. 0	39. 4	40. 8	42. 6	43. 4	45. 4	46. 2	46. 5	46. 3	46. 8	41. 5
1924–25	49. 4	49. 1	47. 1	48. 9	47. 4	50. 6	54. 0	53. 4	49. 7	44. 7	45. 4	48. 3	48. 8
1925–26	45. 3	40. 7	38. 1	37. 2	37. 6	39. 1	40. 0	39. 2	38. 8	39. 4	39. 5	38. 9	39. 8
1926–27	37. 7	37. 9	35. 6	39. 0	39. 8	41. 1	42. 6	43. 4	43. 4	43. 2	45. 4	48. 0	40. 3
1927–28	46. 3	44. 4	43. 9	44. 6	45. 1	48. 1	49. 3	51. 3	54. 5	56. 9	62. 0	61. 4	48. 2
1928–29	56. 2	36. 4	36. 7	39. 0	39. 8	42. 5	48. 7	47. 0	46. 6	45. 8	44. 6	42. 5	42. 0
1929–30	42. 9	42. 7	44. 1	44. 8	43. 1	43. 6	43. 1	43. 0	41. 4	42. 4	40. 9	39. 3	42. 9
1930–31	33. 1	35. 7	36. 1	34. 7	31. 5	32. 3	31. 1	30. 7	30. 1	30. 2	28. 6	26. 1	33. 3
1931–32	23. 3	19. 8	20. 0	20. 1	23. 2	23. 0	22. 7	22. 8	22. 8	22. 8	21. 8	19. 8	21. 5
1932–33	17. 5	14. 8	14. 4	13. 1	13. 1	13. 0							

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1922–December, 1923.

TABLE 62.—*Oats, including oatmeal, in terms of grain: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	29,280	[2] 91	25,690	...	20,181	...	45,036	123	52,195	73
Germany	20,070	15,581	25,833	9,961	47,940	3,964	1,752	2,751	30	1,115
United States	17,754	207	16,251	398	7,966	152	3,123	638	4,437	65
Canada	16,656	2,899	19,532	3,452	4,600	3,980	10,336	714	18,487	1,817
Chile	3,861	...	2,761	...	1,925	...	6,512	...	1,053	...
Czechoslovakia	3,676	1,200	4,453	300	4,424	402	2,408	69	2,435	563
Irish Free State	3,305	1,550	2,404	1,271	2,141	1,216	847	2,421	230	1,618
Rumania	3,302	2	[3] 936	[3] 0	[3] 4,974	[3] 0	6,335	0	[3] 827	[3] 0
Poland	2,713	1,499	267	1,465	5,667	257	858	55	183	39
Hungary	2,134	2	790	1	2,492	1	73	363	17	85
Russia	[4] 2,078	0	78	0	4,242	0	33,773	0	14,619	0
Algeria	1,764	588	3,206	306	1,413	507	4,819	422	923	1,253
Tunis	1,556	81	2,242	0	2,614	0	1,901	24	655	0
Yugoslavia [5]	495	[2] 48	325	71	28	48	6	380	4	43
Total	108,644	23,817	104,768	17,225	110,607	10,527	117,779	7,960	96,075	6,671
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	1,170	30,339	1,020	25,862	958	33,196	1,237	35,576	666	33,309
Switzerland	5	10,936	5	10,741	6	13,613	13	14,263	15	15,645
Belgium	46	8,210	15	9,357	40	8,855	49	10,794	104	5,531
Netherlands	412	7,851	773	6,486	576	11,902	1,173	10,659	160	8,184
Italy	9	7,016	1	5,429	2	5,119	1	12,001	1	11,506
France	648	6,598	394	7,280	233	5,791	73	6,509	24	9,050
Austria	8	6,092	6	5,774	5	8,684	13	6,589	2	4,989
Denmark	217	3,255	326	2,574	63	8,763	65	4,550	237	2,166
Sweden	902	2,956	720	4,172	490	3,853	452	3,779	770	3,946
Finland	25	1,891	13	3,504	0	2,155	24	963	62	673
Cuba	0	[4] 1,215	0	987	...	...	...	...	...	...
Latvia [6]	110	1,127	0	2,883	513	309	16	182	...	...
Norway	8	714	9	336	10	556	13	59	5	857
Estonia	0	693	0	1,356	0	389	0	534	0	24
Greece	0	[4] 348	0	107	0	660	0	3	...	...
Australia	155	276	144	69	184	38	267	25	[3] 311	[3] 7
Union of South Africa	148	160	143	120	169	107	84	104	84	96
Japan [6]	0	96	0	76	0	117	0	8	...	...
Total	3,883	89,773	3,569	87,113	3,249	104,107	3,480	106,598	2,441	95,983

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] 3-year average.
[3] Monthly Crop Report and Agricultural Statistics.
[4] 4-year average.
[5] Calendar year.
[6] Year beginning August, International Yearbook of Agricultural Statistics.

TABLE 63.—*Oats, No. 3, white: Weighted average price [1] per bushel of reported cash sales, Chicago, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	38	40	43	43	44	46	48	47	48	48	51	54	45
1924–25	50	48	50	50	58	58	53	48	42	46	49	44	50
1925–26	41	39	39	40	42	42	41	40	42	41	40	42	41
1926–27	38	38	44	42	46	46	43	44	45	50	49	45	43
1927–28	47	47	48	49	54	55	56	59	63	67	68	56	55
1928–29	36	41	42	44	46	50	50	48	48	46	45	47	44
1929–30	43	48	47	45	45	45	44	43	43	41	38	35	44
1930–31	39	38	36	33	34	32	32	31	30	28	27	23	35
1931–32	21	22	23	26	25	25	24	22	23	23	21	18	22
1932–33	17	17	15	15	15	...	...	...	...	...	...	...	...

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin. Data for 1899–1923 available in 1924 Yearbook, p. 628, Table 94.

[1] Average of daily prices weighted by car-lot sales.

TABLE 64.—*Barley: Acreage, production, value, exports, etc., United States, 1900–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Price per bushel at Chicago, year beginning August[1]	Foreign trade, including barley, flour, and malt, year beginning July[2]: Domestic exports	Foreign trade: Imports	Net exports[3]: Total	Net exports[3]: Percentage of production
	1,000 acres	*Bushels of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1900	4,545	21.1	96,041	40.5	38,896	[4] 56	6,619	175	6,445	6.7
1901	4,742	25.7	121,784	45.2	55,068	64	9,079	60	9,019	7.4
1902	5,126	29.1	149,389	45.5	67,944	56	8,745	59	8,686	5.8
1903	5,508	26.4	146,864	45.4	66,700	56	11,280	94	11,187	7.6
1904	5,912	27.4	162,105	41.6	67,427	49	11,105	84	11,021	6.8
1905	6,250	27.2	170,089	39.4	66,959	50	18,431	20	18,410	10.8
1906	6,730	28.6	192,270	41.6	80,069	61	8,616	41	8,632	4.5
1907	6,941	24.5	170,008	66.3	112,675	84	4,554	202	4,370	2.6
1908	7,294	25.3	184,857	55.2	102,037	67	6,720	4	6,725	3.6
1909	*7,699*	*22.5*	*173,344*							
1909	7,699	24.4	187,973	54.8	102,947	67	4,454	5	4,449	2.4
1910	7,743	22.5	173,832	57.8	100,426	92	9,507	187	9,320	5.4
1911	7,627	21.0	160,240	86.9	139,182	122	1,655	2,772	[5] 1,117	------
1912	7,530	29.7	223,824	50.5	112,957	68	17,874	15	17,859	8.0
1913	7,499	23.8	178,189	53.7	95,731	65	6,945	351	6,594	3.7
1914	*7,565*	25.8	*194,953*	54.3	*105,903*	72	28,712	*103*	28,609	14.7
1915	7,148	32.0	228,851	51.6	118,172	69	30,821	37	30,783	13.5
1916	7,757	23.5	182,309	88.1	160,646	191	20,319	462	19,857	10.9
1917	8,933	23.7	211,759	113.7	240,758	146	28,717	517	28,200	13.3
1918	9,740	26.3	256,225	91.7	234,942	104	29,324	24	29,301	11.4
1919	*6,473*	*18.9*	*122,025*							
1919	6,579	19.9	131,088	121.5	159,258	145	34,691	335	34,356	26.2
1920	7,438	23.1	171,533	71.6	122,746	78	27,255	20	27,234	15.9
1921	7,073	18.5	130,747	42.1	55,059	61	27,546	8	27,538	21.1
1922	6,599	23.3	153,771	52.5	80,792	65	21,909	38	21,871	14.2
1923	7,150	22.2	158,907	53.5	85,089	72	13,913	55	13,858	8.7
1924	*6,767*	*23.5*	*159,139*							
1924	6,910	24.0	165,814	74.7	123,830	90	28,543	48	28,495	17.2
1925	8,076	23.9	192,671	58.6	112,809	72	30,448	53	30,395	15.8
1926	7,840	20.9	163,712	57.1	93,510	77	19,655	49	19,605	12.0
1927	9,419	25.6	240,993	67.5	162,741	91	39,274	45	39,230	16.3
1928	12,710	26.1	331,148	54.7	180,980	60	60,295	45	60,249	18.2
1929	*12,891*	*20.4*	*263,590*							
1929	13,523	20.7	280,242	[6] 53.9	[7] 150,946	62	24,054	41	24,013	8.6
1930	12,666	24.0	303,752	[6] 40.4	[7] 122,620	54	11,443	1,413	10,030	3.3
1931	11,419	17.4	198,380	[6] 32.5	[7] 64,498	40	5,469	1,509	3,960	2.0
1932 [8]	13,213	22.7	299,950	[6] 19.8	[7] 59,255	------	------	------	------	------

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. See 1927 yearbook, p. 799, for data for earlier years.

[1] From Bureau of Labor Statistics as follows: Bulletin No. 39, 1900–1901. August, 1900–December, 1901, Choice to Fancy malting, by samples. Wholesale price bulletins—monthly quotations, January, 1902–December, 1913, Choice to Fancy malting; January, 1914–September, 1927, Fair to Good malting. Beginning October, 1927, grade reported as feeding, but as quality remained unchanged, no change was made in comparative prices.

[2] Compiled from Commerce and Navigation of the United States, 1900–1917: Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932; and official records of the Bureau of Foreign and Domestic Commerce. Malt converted to terms of barley on the basis that 1.1 bushels of malt is the product of 1 bushel of barley. Barley flour converted on the basis that 1 barrel of flour is the product of 9 bushels of barley. Exports of flour not reported prior to 1919. Barley—general imports, 1900–1909; imports for consumption, 1910–1932. Malt—general imports, 1909–1914; imports for consumption, 1915–1932. Imports of flour not reported prior to 1915; imports for consumption, 1915–1932.

[3] Total exports (domestic exports plus reexports) minus total imports.

[4] *Average for 11 months.*

[5] Net imports. Total imports minus total exports (domestic plus foreign).

[6] Weighted average price for crop marketing season.

[7] Based on weighted average price for crop marketing season.

[8] *Preliminary.*

TABLE 65.—*Barley: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Maine	3	3	4	28.6	29.0	30.0	95	87	120	58	54
Vermont	5	5	5	25.4	30.0	28.0	141	150	140	57	49
New York	182	173	154	25.9	25.0	26.0	5,184	4,325	4,004	43	37
New Jersey	1	1	1	26.4	32.0	25.0	29	32	25	44	42
Pennsylvania	18	60	69	22.2	26.5	25.0	445	1,590	1,725	46	39
North Atlantic	210	242	233	25.7	25.6	25.8	5,893	6,184	6,014	44.3	38.2
Ohio	153	96	90	25.1	27.5	21.0	4,175	2,640	1,890	31	24
Indiana	36	45	45	20.3	24.4	20.0	766	1,098	900	29	25
Illinois	357	297	371	29.4	29.0	28.5	10,884	8,613	10,574	38	24
Michigan	165	278	328	23.4	26.0	20.0	4,418	7,228	6,560	39	30
Wisconsin	544	731	768	28.9	26.0	30.0	17,248	19,006	23,040	43	30
Minnesota	1,383	1,874	1,968	24.6	20.0	24.0	38,045	37,480	47,232	31	18
Iowa	367	521	600	27.8	26.0	25.0	11,415	13,546	15,000	32	20
Missouri	10	20	19	19.6	24.0	17.0	194	480	323	33	27
North Dakota	1,811	1,812	2,265	18.4	10.2	17.5	37,630	18,482	39,638	23	12
South Dakota	1,080	1,833	2,053	19.6	9.1	23.2	22,797	16,680	47,630	27	13
Nebraska	277	820	918	21.6	16.5	20.0	6,462	13,530	18,360	25	16
Kansas	425	563	704	15.7	16.0	14.0	6,171	9,008	9,856	22	14
North Central	6,607	8,890	10,129	22.0	16.6	21.8	160,205	147,791	221,003	30.9	17.5
Maryland	9	16	21	27.3	33.0	29.0	260	528	609	40	35
Virginia	12	17	24	25.4	33.5	25.5	307	570	612	40	38
North Carolina	10	24	19	[2] 18.5	20.0	17.0	178	480	323	60	51
South Atlantic	31	57	64	24.9	27.7	24.1	744	1,578	1,544	46.1	39.6
Kentucky	5	12	10	22.5	30.0	20.0	120	360	200	39	36
Tennessee	15	17	20	17.7	22.5	16.2	259	382	324	48	43
Oklahoma	119	106	138	15.6	21.0	12.5	1,826	2,226	1,725	26	18
Texas	167	221	210	19.3	23.5	17.0	3,112	5,194	3,570	23	17
South Central	305	356	378	17.7	22.9	15.4	5,318	8,162	5,819	25.7	19.4
Montana	160	139	195	22.8	15.0	20.0	4,303	2,085	3,900	37	24
Idaho	122	148	163	29.6	26.0	36.0	3,791	3,848	5,868	33	23
Wyoming	57	98	127	22.6	17.5	19.0	1,418	1,715	2,413	40	25
Colorado	387	472	439	19.4	15.5	15.5	7,107	7,316	6,804	27	19
New Mexico	7	11	13	17.6	23.0	17.0	114	253	221	31	24
Arizona	13	10	15	30.1	32.0	35.0	415	320	525	48	36
Utah	23	38	44	32.3	32.0	39.0	857	1,216	1,716	47	34
Nevada	7	5	7	36.0	31.0	38.0	292	155	266	57	41
Washington	65	59	64	31.5	30.0	30.0	2,042	1,770	1,920	35	33
Oregon	71	74	96	26.2	30.0	28.0	1,909	2,220	2,688	40	33
California	925	820	1,246	26.6	16.8	31.5	24,460	13,776	39,249	45	25
Western	1,838	1,874	2,409	25.7	18.5	27.2	46,708	34,674	65,570	38.4	25.1
United States	8,991	11,419	13,213	22.8	17.4	22.7	215,868	198,389	299,950	32.5	19.8

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.
[2] 5-year average.

Table 66.—*Barley: World production, 1894–95 to 1932–33*

Crop year	Estimated world production, excluding Russia	Estimated European production, excluding Russia	Selected countries							
			United States	Russia[1]	Germany	Japan	Canada	India	Spain	Rumania
	Million bushels	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*	*Million bushels*
1894–95	1,035	544	78	197	131	81			57	17
1895–96	1,008	527	115	226	128	80			47	22
1896–97	973	528	99	254	125	71			36	32
1897–98	907	481	103	239	118	73			46	21
1898–99	1,039	564	100	307	130	83			73	30
1899–1900	1,017	533	117	227	137	77			54	8
1900–1	1,032	522	96	237	138	82			57	15
1901–2	1,085	570	122	240	153	83			80	24
1902–3	1,127	592	149	338	142	74			81	25
1903–4	1,103	593	147	357	153	60			64	30
1904–5	1,068	512	162	346	135	81			54	12
1905–6	1,067	532	170	347	134	77			46	26
1906–7	1,226	610	192	331	143	84			90	34
1907–8	1,161	509	170	377	161	90			54	20
1908–9	1,132	536	185	402	141	87	47		70	13
1909–10	1,338	621	188	502	161	87	55		79	20
1910–11	1,242	560	174	488	133	82	29		76	20
1911–12	1,326	606	160	437	145	86	44		87	26
1912–13	1,345	589	224	496	160	91	49		60	21
1913–14	1,395	632	178	600	169	101	48		69	27
1914–15	1,213	546	195	[2] 433	144	86	36	125	72	26
1915–16	1,244	477	229	[3] 429	114	95	54	143	84	29
1916–17	1,201	507	182	[4] 305	128	89	43	148	87	30
1917–18	1,170	427	212	325	[5] 86	89	55	156	78	
1918–19	1,277	424	256		94	[6] 89	77	156	90	[5] 5
1919–20	1,104	483	131		75	95	56	130	82	32
1920–21	1,234	554	172	216	82	92	63	150	90	68
1921–22	1,216	555	131	118	89	88	60	117	89	44
1922–23	1,278	588	154	176	74	87	72	146	78	94
1923–24	1,377	649	159	196	108	71	77	145	112	61
1924–25	1,296	566	166	181	110	75	89	137	84	31
1925–26	1,465	672	193	269	119	91	87	123	99	47
1926–27	1,435	674	164	246	113	88	100	121	96	77
1927–28	1,459	659	241	203	126	82	97	119	92	58
1928–29	1,672	743	331	280	154	81	136	98	83	69
1929–30	1,754	827	280	331	146	80	102	118	97	126
1930–31	1,687	759	304	311	131	72	135	107	104	100
1931–32	1,485	691	198		139	77	67	112	91	65
1932–33 [7]	1,669	799	300		148	78	83		127	82

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends early in 1932.

[1] Includes all Russian territory reporting for the years shown.

[2] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

[3] Exclusive of Russian Poland, Lithuania, parts of present Latvia and the Ukraine, and two Provinces of Transcaucasia.

[4] Beginning this year, estimates within present boundaries of the Union of Socialist Soviet Republics excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924–25 produced 20,897,000 bushels.

[5] Post-war boundaries beginning this year and therefore not comparable with earlier years.

[6] Beginning this year weighed bushels, those reported for the earlier years being measured bushels.

[7] Preliminary.

TABLE 67.—*Barley: Acreage, yield per acre, and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Acreage					Yield per acre					Production				
	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
North America:															
Canada	3,022	5,926	5,559	3,768	3,758	25.4	17.3	24.3	17.9	22.1	76,899	102,313	135,160	67,383	82,981
United States	7,162	13,523	12,666	11,419	13,213	22.4	20.7	24.0	17.4	22.7	160,394	280,242	303,752	198,389	299,950
Estimated North American total	10,800	19,900	18,600	15,600	17,400						241,000	385,000	442,000	269,000	386,000
Europe:															
England and Wales	1,352	1,120	1,020	1,029	961	34.2	41.6	33.7	35.0	37.3	46,274	46,552	34,377	36,066	35,798
Scotland	158	101	107	88	69	38.6	46.7	41.4	39.2	44.6	6,092	4,713	4,433	3,453	3,080
Irish Free State	156	118	116	116	103	38.3	50.5	47.6	42.4		5,981	5,960	5,517	4,921	
Norway	137	132	134	138	137	32.0	34.3	36.7	30.5	40.7	4,383	4,533	4,922	4,207	5,578
Sweden	409	308	327	311	292	31.6	36.9	33.7	34.5	34.6	12,921	11,372	11,032	10,715	10,105
Denmark	695	917	928	889	782	46.4	55.7	52.0	49.5	58.1	32,246	51,093	48,271	43,972	45,470
Netherlands	63	78	76	71	50	52.4	64.2	52.9	46.1	54.2	3,302	5,010	4,017	3,274	2,710
Belgium	84	63	84	83	89	49.1	45.0	45.5	48.4	48.4	4,127	2,834	3,825	4,018	4,308
France	1,713	1,946	1,842	1,865	1,815	25.6	30.6	23.0	25.6	29.6	43,892	59,504	42,456	47,730	53,678
Spain	4,343	4,489	4,543	4,644	4,837	21.2	21.7	22.9	19.5	26.3	92,268	97,339	103,922	90,724	127,267
Portugal	182	174	171	170		11.3	11.3	13.8	11.9		2,053	1,968	2,367	2,025	2,398
Italy	567	579	583	538	530	18.1	20.8	19.2	20.6	21.8	10,283	12,071	11,202	11,061	11,537
Germany	3,198	3,835	3,753	4,001	3,875	31.3	38.1	35.0	34.6	38.1	100,182	146,089	131,369	138,622	147,647
Austria	320	391	430	416	428	22.1	31.6	28.6	23.9	32.4	7,072	12,375	12,278	9,948	13,861
Czechoslovakia	1,670	1,836	1,667	1,775	1,759	30.0	34.9	33.6	27.8	39.3	50,119	64,072	55,932	49,356	69,119
Hungary	1,096	1,178	1,131	1,165	1,165	20.3	26.6	24.4	18.8	27.9	22,198	31,352	27,605	21,867	32,497
Yugoslavia	902	1,055	1,097	1,065	1,006	15.6	17.9	16.9	16.9	17.9	14,027	18,917	18,573	17,996	17,982
Greece	383	357	537	550	574	14.8	13.3	14.6	13.0	20.0	5,676	4,755	7,831	7,146	11,483
Bulgaria	539	542	692	607	568	17.2	17.3	28.7	27.3	24.8	9,266	9,381	19,868	16,560	14,102
Rumania	4,315	5,074	4,881	4,742	4,411	12.8	24.8	22.3	13.7	18.6	55,295	125,867	108,912	64,962	82,216
Poland	2,547	3,110	3,048	3,144	2,976	19.6	24.5	22.1	21.6	23.7	49,850	76,233	67,236	67,779	70,606
Lithuania	451	529	448	474	470	20.5	23.2	24.3	22.9	21.6	9,234	12,284	10,883	10,845	10,178
Latvia	414	452	437	451	457	16.9	21.1	19.7	19.5	19.4	6,979	9,548	8,605	8,808	8,849
Estonia	303	281	276	279	266	18.0	20.2	21.4	21.2	15.6	5,464	5,687	5,893	5,918	4,147

Finland	273	284	272	276	300	21.2	22.7	22.9	27.6	26.7	5,782	6,451	6,223	7,606	8,015
Russia, European and Asiatic	14,793	19,978	17,790	16,853	16,936	12.7	16.6	17.5			187,970	331,311	311,082		
Total Europe reporting area and production, all years	25,932	28,657	28,313	28,601	27,817	23.0	28.5	26.5	23.9	28.4	596,932	818,032	749,665	682,636	790,227
Estimated European total excluding Russia	26,300	29,000	28,600	28,900	28,100						606,000	827,000	759,000	691,000	799,000
Africa:															
Morocco	2,862	3,240	3,207	3,222	2,930	14.1	14.6	11.7	18.3	12.7	40,304	47,316	37,490	59,032	37,254
Algeria	3,017	3,536	3,649	3,178	3,279	10.2	11.4	10.5	8.4	9.1	30,779	40,445	38,186	26,746	29,855
Tunis	1,033	1,248	1,202	1,223	1,483	6.6	9.2	4.6	6.8	10.5	6,843	11,482	5,512	6,268	15,616
Egypt	381	401	345	306	366	30.0	31.6	30.4	31.7	33.0	11,427	12,669	10,505	9,693	12,067
Estimated African total	8,100	9,000	8,900	8,300	8,400						101,000	120,000	98,000	111,000	102,000
Asia:															
Turkey	[3] 2,146	3,185	3,418			[3] 29.5	26.3	21.3			[3] 57,482	83,775	72,890	91,858	52,635
India	7,501	9,155	7,049	8,194		17.8	12.8	15.2	13.6		133,793	117,600	107,007	111,627	
Syria and Lebanon	[4] 796	796	870	818	810	[4] 9.5	30.7	26.2	17.4	11.3	7,300	24,406	22,769	14,193	9,163
Japan	2,630	2,195	2,115	2,097	2,107	31.4	36.6	34.3	36.5	36.9	82,490	80,358	72,472	76,519	77,744
Chosen	2,131	2,295	2,382	2,191	2,206	17.2	16.4	16.7	19.1	20.0	36,607	37,612	39,847	41,861	44,086
Estimated Asiatic total	17,200	20,400	20,100	18,500	19,400						347,000	375,000	346,000	365,000	323,000
Total Northern Hemisphere countries reporting area and production, all years	48,966	61,817	60,308	56,823	57,969	21.4	23.5	23.5	20.8	24.1	1,049,975	1,454,875	1,415,358	1,184,720	1,398,943
Estimated Northern Hemisphere total, excluding Russia and China	62,400	78,300	76,200	71,300	73,300						1,295,000	1,707,000	1,645,000	1,436,000	1,610,000
SOUTHERN HEMISPHERE															
Chile	162	152	166	106	155	33.0	30.2	23.3	29.3		5,347	4,589	3,876	3,097	
Argentina	504	802	921	[5] 1,439	[5] 1,520	19.7	20.1	15.2	[6] 15.4	[6] 21.2	9,924	16,131	14,000	22,124	32,150
Union of South Africa	97	110	70	76		12.3	20.0	16.9			1,189	2,201	1,184		
Australia	307	451	383			19.7	17.5	18.1			6,048	7,905	6,938		
Estimated Southern Hemisphere total	1,500	2,100	2,200	2,200	2,300						31,000	47,000	42,000	49,000	59,000
Total Northern and Southern Hemisphere countries reporting area and production, all years	49,470	62,619	61,229	58,262	59,489	21.4	23.5	23.3	20.7	24.1	1,059,899	1,471,006	1,429,358	1,206,844	1,431,09
Estimated world total, excluding Russia and China	63,900	80,400	78,400	73,500	75,600						1,326,000	1,754,000	1,687,000	1,485,000	1,669,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends early in 1932.

[1] Preliminary. [2] 2-year average. [3] 1 year only. [4] 4-year average. [5] Acreage sown. [6] Yield per acre sown.

TABLE 68.—*Barley: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning June	Percentage of receipts during— June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1922–23	1.5	14.4	20.8	15.1	12.3	7.0	7.9	5.6	4.1	3.0	2.3	3.2	1.9	100.0
1923–24	2.4	11.6	20.2	14.0	11.8	9.3	8.0	5.7	4.5	3.8	3.6	3.2	1.9	100.0
1924–25	3.2	9.9	16.2	20.1	16.6	8.4	5.9	5.2	3.8	3.4	2.2	2.7	2.4	100.0
1925–26	4.3	14.4	19.0	18.4	11.8	6.9	5.4	4.3	3.5	3.4	2.4	3.6	2.6	100.0
1926–27	5.8	16.1	21.2	12.9	8.8	7.0	5.3	5.3	3.2	3.8	3.7	3.8	3.1	100.0
1927–28	6.3	9.5	18.2	10.8	12.3	7.7	6.0	4.9	4.5	4.5	2.3	2.1	1.9	100.0
1928–29	6.1	10.4	21.8	18.7	12.1	7.1	5.9	3.6	3.7	3.2	2.7	2.4	2.3	100.0
1929–30	7.2	17.4	25.3	13.4	9.2	5.7	4.7	3.6	3.0	3.0	2.7	2.9	1.9	100.0
1930–31	9.0	8.8	24.9	16.6	10.4	6.0	5.1	4.5	3.5	3.3	3.1	3.1	1.7	100.0
1931–32	3.9	16.4	21.5	13.9	10.5	6.2	5.5	4.5	4.0	4.4	4.2	3.3	1.7	100.0

Bureau of Agricultural Economics.

TABLE 69.—*Barley: Receipts graded by licensed inspectors, all inspection points, total of all classes under each grade, 1926–27 to 1931–32*

Year beginning July	Grade Choice No. 1	No. 1	Choice No. 2	Special No. 2	No. 2	Choice No. 3	No. 3	No. 4	No. 5	No. 1 feed	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1926–27 [1]	251	481	107	2,168	2,005	421	4,929	4,026	266	916	15,063	30,633
1927–28	262	2,199	90	14,913	12,151	274	16,299	6,197	183	2,875	10,923	66,336
1928–29	329	966	100	13,128	20,900	392	25,264	20,129	135	6,502	11,021	98,886
1929–30	223	700	50	9,966	5,800	315	13,907	7,269	102	3,602	5,124	47,058
1930–31	261	1,483	76	11,629	7,067	249	12,489	6,305	127	2,034	1,927	43,647
1931–32	142	568	35	6,014	2,410	130	8,958	2,743	146	865	873	22,884

Bureau of Agricultural Economics. 1 car equivalent to 1,400 bushels.

[1] Barley grades became effective Aug. 24, 1926.

TABLE 70.—*Barley: Commercial stocks, 1926–27 to 1932–33*

DOMESTIC BARLEY IN UNITED STATES [1]

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27						7,097	6,664	6,116	5,339	3,675	3,046	2,720
1927–28	3,108	5,041	6,549	5,957	5,769	4,826	4,423	4,273	4,588	3,890	2,410	2,801
1928–29	3,395	9,318	10,681	11,067	11,744	10,926	11,985	11,399	9,998	8,412	7,373	6,861
1929–30	9,798	12,894	12,563	12,721	11,760	12,074	10,961	10,415	9,726	8,137	6,843	6,366
1930–31	6,746	10,945	15,856	15,018	14,637	13,987	14,261	12,279	10,159	7,319	6,232	6,716
1931–32	6,568	7,093	7,211	7,355	7,124	6,164	5,710	5,185	4,179	3,732	3,005	2,793
1932–33	3,440	6,651	8,976	9,380	9,862							

UNITED STATES BARLEY IN CANADA

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1926–27						272	300	64	70	59	0	13
1927–28	5	66	665	344	152	40	42	9	25	9	1	20
1928–29	0	767	4,171	5,599	2,319	1,144	312	173	170	81	92	659
1929–30	279	246	1,266	1,749	955	972	937	938	936	993	963	937
1930–31	797	652	580	444	371	338	309	291	272	243	68	45
1931–32	45	24	24	24	24	25	25	25	25	25	77	6
1932–33	1	130	114	111	21							

CANADIAN BARLEY IN UNITED STATES [2]

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
1926–27						2,942	2,246	1,677	608	2,401	1,573	175
1927–28	19	27	27	717	1,768	4,945	1,499	1,191	557	112	483	278
1928–29	300	249	1,751	2,959	4,778	6,210	4,731	3,232	2,259	2,523	3,315	2,110
1929–30	2,277	1,711	1,654	1,999	2,637	3,086	3,006	2,928	2,781	2,715	2,376	2,376
1930–31	1,839	1,300	725	832	1,561	1,329	1,274	1,267	903	764	627	353
1931–32	119	3	4	4	649	1,587	1,587	1,552	1,479	1,272	283	57
1932–33	1	2	27	46	0							

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the 1st day of the month.

[1] Includes barley in store in public and private elevators in 42 important markets and also barley afloat in vessels or barges in harbors of lake and seaboard ports. Barley in transit either by rail or water, mill stocks, or small private stocks of barley intended only for local purposes, not included.

[2] Includes barley stored at lake and seaboard ports, exclusive of barley in transit on lakes and canals.

TABLE 71.—*Barley, excluding flour and malt: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
United States	31,869	0	50,996	0	21,544	0	10,302	0	5,084	0
Rumania	30,308	0	[3] 17,550	[2] 0	[3] 63,522	[2] 0	74,095	2	[2] 32,748	[2] 0
Canada	26,724	14	38,668	8	6,396	17	16,603	1	14,449	2
Russia	[3] 19,606	0	0	0	23,986	0	49,831	0	37,544	0
Argentina	9,355	[3] 6	8,591	-------	5,986	-------	11,612	0	13,822	0
Poland	7,120	90	7,989	102	12,476	6	6,091	2	6,550	0
Czechoslovakia	5,301	360	3,643	14	5,293	31	6,252	8	4,121	5
Algeria	4,701	750	6,663	262	5,298	305	3,076	782	1,251	5,624
Tunis	4,291	[3] 477	7,278	42	6,734	79	621	894	1,013	1,168
Chile	2,936	0	2,137	0	1,859	0	1,166	0	1,079	0
Hungary	2,611	3	1,280	2	4,966	2	1,231	7	108	81
British India	2,169	-------	1,402	2	46	21	261	5	1,793	-------
Bulgaria	1,650	0	1,969	0	650	0	3,307	0	892	0
Australia	*1,235*	*1*	*1,338*	*1*	*683*	*2*	*3,472*	*0*	[2] *3,408*	[2] *0*
Yugoslavia [4]	790	[3] 412	256	484	491	375	160	306	62	130
Spain	531	379	414	318	330	18	335	0	44	0
Sweden	507	13	24	3	92	2	4	41	41	5
Egypt	311	213	717	1	138	75	5	239	3	660
Total	154,015	2,724	156,915	1,239	160,490	933	188,424	2,287	124,012	7,665
PRINCIPAL IMPORTING COUNTRIES										
Germany	642	83,542	409	78,441	2,000	102,529	423	36,660	38	34,923
United Kingdom	-------	32,134	-------	31,418	-------	29,798	-------	37,827	-------	30,797
Netherlands	790	14,460	1,159	17,045	1,066	16,572	1,232	30,204	563	20,030
Belgium	258	13,586	192	14,592	311	10,440	2,200	21,566	3,427	19,761
Denmark	2,891	3,494	2,884	1,630	2,738	7,522	2,569	30,974	990	8,200
Switzerland	0	3,306	0	4,252	0	3,802	1	5,770	2	6,383
Austria	[5] 134	3,163	38	2,432	23	3,800	36	4,644	3	4,349
France	1,044	2,830	452	5,483	693	3,230	87	15,100	34	19,515
Norway	0	1,382	0	1,102	0	1,617	0	2,293	0	1,737
Irish Free State	430	885	435	849	53	1,067	42	595	52	996
Greece	0	593	0	603	0	874	0	171	0	353
Cuba	0	[5] 260	0	3	0	-------	0	-------	-------	-------
Estonia	*0*	*244*	*0*	*516*	*0*	*154*	*0*	*34*	*0*	-------
Italy	23	209	17	128	3	193	0	1,206	0	1,385
Total	6,212	160,088	5,586	158,494	6,887	187,598	6,590	187,044	5,109	148,429

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] Monthly Crop Report and Agricultural Statistics.
[3] 3-year average.
[4] Calendar year.
[5] 4-year average.

TABLE 72.—*Barley: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	54.7	52.2	51.9	54.7	55.2	57.6	56.5	58.0	60.0	61.0	60.0	61.9	55.3
1924–25	68.8	75.7	75.6	81.4	79.7	76.2	82.4	84.8	81.5	76.1	75.9	76.4	77.3
1925–26	73.5	67.1	60.8	57.6	58.0	58.4	59.5	56.3	54.6	54.8	55.1	53.7	62.3
1926–27	65.3	55.0	52.9	54.4	56.0	56.4	58.0	61.3	62.2	64.1	68.4	76.3	59.6
1927–28	71.4	69.0	69.5	66.8	66.8	71.5	73.6	75.4	79.4	81.3	84.5	81.7	72.0
1928–29	77.6	58.9	54.1	55.2	54.5	55.0	56.2	60.5	60.1	58.0	55.3	52.6	58.9
1929–30	55.6	55.8	55.2	54.7	53.8	54.6	53.9	52.5	51.4	51.7	50.5	47.5	54.0
1930–31	40.0	43.6	45.3	41.9	38.3	38.8	36.6	35.3	34.4	35.2	35.5	32.6	41.1
1931–32	30.0	28.9	30.9	31.6	35.5	35.7	35.7	35.8	37.2	37.1	33.7	28.7	32.2
1932–33	24.6	21.1	20.1	18.2	20.1	19.3	-------	-------	-------	-------	-------	-------	-------

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1922–December, 1923

TABLE 73.—*Barley, No. 2: Weighted average price*[1] *per bushel of reported cash sales, Minneapolis, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	56	58	60	61	62	62	68	70	75	70	73	76	63
1924–25	80	81	85	81	87	93	94	88	81	84	84	84	84
1925–26	72	66	65	63	65	65	62	62	63	65	64	67	67
1926–27	63	62	65	64	67	69	71	72	77	88	88	81	71
1927–28	77	72	73	77	83	84	87	90	92	93	94	85	84
1928–29	65	63	63	62	62	66	70	67	65	60	60	69	65
1929–30 [2]	62	63	59	60	60	58	57	56	57	56	50	48	59
1930–31 [2]	53	54	52	48	47	44	44	44	48	45	39	42	47
1931–32 [2]	45	50	50	51	51	51	52	53	51	44	35	31	48
1932–33 [2]	31	32	29	31	29								

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record. Prices 1909–10 to 1922–23, appear in 1932 Yearbook, Table 89.

[1] Average of daily prices weighted by car-lot sales.
[2] Special No. 2 barley used, August, 1929, to end of table.

TABLE 74.—*Flaxseed: Acreage, production, value, foreign trade, net supply, etc., United States, 1909–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Price per bushel of No. 1 flaxseed at Minneapolis, year beginning Aug. 1 [1]	Flaxseed, including linseed oil, in terms of seed, year beginning Sept. [2]: Imports	Exports, domestic and foreign	Net imports	Net supply
	1,000 acres	*Bushels of 56 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1909	*2,083*	*9.4*	*19,513*							
1909	2,083	9.5	19,699	152.8	30,093	197	6,074	152	5,922	25,621
1910	2,467	5.2	12,718	231.7	29,472	250	12,010	73	11,937	24,655
1911	2,757	7.0	19,370	182.1	35,272	218	7,848	126	7,722	27,092
1912	2,851	9.8	28,073	114.7	32,202	142	3,845	897	2,948	31,021
1913	2,291	7.8	17,853	119.9	21,399	150	9,772	216	9,556	27,409
1914	1,645	8.4	13,749	126.0	17,318	170	12,729	571	12,158	25,907
1915	1,387	10.1	14,030	174.0	24,410	200	14,441	313	14,128	28,158
1916	1,474	9.7	14,296	248.6	35,541	260	10,946	507	10,439	24,735
1917	1,984	4.6	9,164	296.6	27,182	370	14,042	467	13,575	22,739
1918	1,910	7.0	13,369	340.1	45,470	407	9,230	482	8,748	22,117
1919	*1,261*	*5.3*	*6,653*							
1919	1,293	5.2	6,770	438.3	29,673	473	26,483	467	26,016	33,194
1920	1,647	6.6	10,900	177.0	19,296	220	16,174	219	15,955	26,707
1921	1,143	7.1	8,107	145.2	11,771	216	23,389	149	23,240	31,269
1922	1,113	9.5	10,520	211.8	22,277	259	29,009	161	28,848	39,223
1923	2,015	8.2	16,563	210.7	34,898	244	19,557	145	19,412	36,472
1924	*3,435*	*8.2*	*28,246*							
1924	3,535	8.8	31,237	227.4	71,048	263	12,849	124	12,725	44,272
1925	3,022	7.4	22,337	226.6	50,610	253	20,858	148	20,710	43,134
1926	2,736	6.8	18,537	194.1	35,987	225	24,155	112	24,043	43,378
1927	2,763	9.1	25,183	186.0	46,849	221	18,177	120	18,057	43,904
1928	2,611	7.3	19,140	201.2	38,515	229	23,611	106	23,505	43,433
1929	*2,966*	*5.1*	*15,046*							
1929	3,047	5.2	15,910	[3] 281.2	[4] 44,733	311	18,537	109	18,428	34,338
1930	3,736	5.7	21,287	[3] 161.0	[4] 34,278	176	9,938	69	9,869	31,109
1931	2,416	4.9	11,798	[3] 116.6	[4] 13,758	136	10,949	46	10,903	21,921
1932 [5]	2,087	5.7	11,841	[3] 86.1	[4] 10,196					

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. See 1927 Year Book, page 809, for data for earlier years.

[1] The figures shown, 1909–1920, are averages of daily closing prices compiled from annual reports of the Minneapolis Chamber of Commerce; 1921–1931, are averages of daily prices weighted by car-lot sales, compiled from Minneapolis Daily Market Record.
[2] Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June, July, and August issues, 1919–1926, January, June, July, and August issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce. 1 bushel of flaxseed weighs 56 pounds; 1 bushel of seed yields 2½ gallons of oil; and 1 gallon of oil weighs 7½ pounds.
[3] Weighted average price for crop marketing season.
[4] Based on weighted average price for crop-marketing season.
[5] Preliminary.

TABLE 75.—*Flaxseed: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932.*

State	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Wisconsin	10	7	6	11.4	9.5	12.0	121	66	72	116	93
Minnesota	750	861	620	9.4	7.0	9.2	7,264	6,027	5,704	121	90
Iowa	14	23	25	9.6	8.0	9.0	148	184	225	120	84
Missouri	3	2	2	[2] 5.9	5.0	5.5	16	10	11	123	72
North Dakota	1,403	1,057	930	7.0	3.8	4.0	10,330	4,017	3,720	112	85
South Dakota	519	211	165	7.7	3.1	4.7	3,784	654	776	113	82
Nebraska	7	6	3	8.4	3.5	6.0	58	21	18	99	69
Kansas	39	61	46	6.4	5.5	6.5	243	336	299	112	72
Montana	186	178	285	6.1	2.6	3.5	1,293	463	998	108	76
Wyoming	4	10	5	6.0	2.0	3.5	30	20	18	102	84
United States	2,033	2,416	2,087	7.6	4.9	5.7	23,287	11,798	11,841	116.6	86.1

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.
[2] 5-year average.

TABLE 76.—*Flaxseed: World production, 1919–20 to 1932–33*

Crop year	World production, including Russia [1]	Northern Hemisphere production, including Russia	European production, including Russia	Selected countries							
				Argentina	Russia	United States	India	Canada	Poland	Lithuania [2]	Uruguay
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1919–20	86,465	36,877	13,425	49,890	[3] 8,000	6,770	9,400	5,473	556	827	932
1920–21	113,534	52,361	14,894	60,006	9,204	10,900	16,760	7,998	637	1,011	966
1921–22	75,121	38,427	14,424	36,046	9,752	8,107	10,800	4,112	856	900	519
1922–23	98,745	50,236	13,813	47,577	11,043	10,520	17,440	5,008	1,816	1,108	719
1923–24	125,098	65,797	19,664	58,005	13,379	16,563	21,320	7,140	2,129	1,056	1,178
1924–25	131,221	84,460	23,982	45,084	16,960	31,237	18,520	9,695	1,872	1,332	1,542
1925–26	159,128	81,876	32,391	75,113	23,991	22,337	20,040	6,237	2,250	1,571	2,030
1926–27	153,945	71,080	28,861	80,783	20,877	18,537	16,080	5,995	2,472	1,574	1,970
1927–28	158,194	76,715	29,146	82,672	21,814	25,183	16,240	4,885	2,790	1,405	1,954
1928–29	150,000	68,607	30,530	78,377	23,690	19,140	13,920	3,614	2,413	1,000	2,030
1929–30	122,764	69,269	37,776	50,004	28,060	15,910	12,880	2,060	3,173	1,718	3,228
1930–31	155,100	79,376	37,815	70,264	29,957	21,287	15,200	4,399	2,335	1,532	5,056
1931–32	157,500	63,135	32,631	89,067	[3] 27,000	11,798	15,080	2,465	1,941	1,003	4,837
1932–33	-------	-------	-------	53,147	-------	11,841	16,440	2,446	-------	563	-------

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere, which immediately follow; thus for 1932–33 the crop harvested in the Northern Hemisphere countries in 1932 is combined with the Southern Hemisphere harvest which begins late in 1932 and ends early in 1933.

[1] Excludes a few minor producing countries for which no statistics are available and which do not enter into world trade.
[2] Flax and hemp.
[3] Estimate of Bureau of Agricultural Economics.

TABLE 77.—*Flax: Acreage and production in specified countries, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Acreage					Seed production					Fiber production				
	Average 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]	Average 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33 [1]
NORTHERN HEMISPHERE															
North America:	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Canada	769, 552	382, 359	581, 800	627, 430	453, 700	6, 438	2, 060	4, 399	2, 465	2, 446					
United States	2, 165, 600	3, 047, 000	3, 736, 000	2, 416, 000	2, 087, 000	17, 753	15, 910	21, 287	11, 798	11, 841					
Total North America	2, 935, 152	3, 429, 359	4, 317, 800	3, 043, 430	2, 540, 700	24, 191	17, 970	25, 686	14, 263	14, 287					
Europe:															
United Kingdom—															
England and Wales	7, 801	6, 403	3, 900	3, 186											
Northern Ireland	36, 267	33, 911	28, 507	7, 440	6, 092						12, 123	15, 487	12, 013	3, 091	
Irish Free State	8, 288	6, 283	3, 950	647	458						2, 662	2, 771	1, 575		
Sweden [2]	5, 651	1, 322	1, 322			6	2	2			685	207	220		
Netherlands	27, 839	47, 456	37, 317	16, 185	4, 843	324	653	358	139		16, 166	34, 000	22, 957	9, 918	3, 086
Belgium	47, 290	67, 589	56, 265	36, 032	21, 000	410	708	417	326	166	40, 004	41, 216	32, 499	25, 370	14, 887
France	45, 508	108, 297	75, 373	25, 619	23, 260	363	1, 078	749	233	218	29, 123	87, 050	44, 753	13, 788	14, 941
Spain	[3] 3, 856	1, 337	2, 132	2, 231		48	7	13	11		[3] 1, 278	617	1, 267	1, 226	
Italy	51, 700	28, 370	27, 132	24, 287	21, 653	451	265	223	184	188	5, 159	7, 297	5, 573	4, 837	5, 397
Germany	104, 027	32, 523	27, 309	16, 368	11, 149										
Austria	9, 055	12, 100	13, 000	12, 891	13, 000	55	44	34	33	36	7, 433	15, 605	12, 694	10, 701	10, 582
Czechoslovakia	56, 438	47, 000	31, 000	22, 931	16, 370	349	308	169	100	91	28, 397	20, 728	12, 816	7, 469	6, 814
Hungary	6, 918	12, 469	36, 169	46, 851	19, 605	48	99	341	310		5, 237	7, 912	86, 912	73, 687	
Yugoslavia	33, 179	32, 822	32, 518	30, 764			55	55			18, 465	23, 574	25, 792	23, 193	
Bulgaria	635	652	736	1, 759	998	3	4	5	19	11	188	130	239	176	163
Rumania	40, 021	42, 798	43, 527	68, 560	71, 000	224	278	393	523		[4] 10, 770	5, 991	5, 933	15, 756	
Poland	229, 360	277, 357	285, 423	252, 188	232, 000	1, 785	3, 173	2, 335	1, 941		87, 774	148, 808	97, 298	75, 611	57, 320
Lithuania [3]	144, 360	213, 000	204, 000	139, 000	99, 000	1, 195	1, 718	1, 532	1, 003	563	62, 119	74, 913	64, 188	46, 628	27, 070
Latvia [1]	132, 076	137, 880	128, 000	104, 000	78, 000	783	904	733	499	366	46, 964	48, 347	42, 395	28, 660	20, 877
Estonia	75, 365	79, 000	80, 424	45, 296	36, 222	387	420	499	253	149	22, 187	21, 498	23, 744	13, 056	7, 443
Finland [5]	14, 761	12, 000	14, 000	10, 000	11, 000						3, 239	3, 527	3, 527		
Russia, including Asiatic Russia	2, 799, 900	5, 074, 446	5, 551, 102	7, 574, 000	7, 788, 000	15, 025	28, 060	29, 957			644, 969	795, 045	903, 908		
Total European countries reporting all years, including Asiatic Russia	3, 829, 808	6, 233, 131	6, 643, 234	8, 404, 054	8, 453, 650	3, 996	5, 449	4, 361	2, 650	1, 788	345, 514	499, 592	359, 156	236, 214	168, 580

Morocco	40, 844	42, 239	58, 046	89, 000	61, 000	363	400	448	932	...	...	...	...	...	...
Algeria	643	494	494	...	...	7	3	8	...	...	[4] 441	...	...	...	...
Tunis	5, 996	5, 752	5, 411	5, 000	...	30	47	...	...	...	...	...	...	...	...
Egypt	3, 181	4, 249	2, 659	2, 698	2, 346	31	53	34	36	28	2, 090	2, 792	1, 702	...	...
India	3, 216, 200	3, 109, 000	2, 802, 000	3, 008, 000	3, 241, 000	17, 624	12, 880	15, 200	15, 080	16, 440	...	...	...	...	...
Japanese Empire:															
Japan	49, 911	25, 950	21, 226	...	...	304	121	119	...	...	61, 242	38, 905	34, 308	...	...
Chosen	3, 386	3, 915	3, 846	3, 634	...	...	...	...	...	...	1, 141	1, 052	1, 523	991	...
Total Northern Hemisphere countries reporting all years	10, 025, 185	12, 817, 978	13, 823, 739	14, 547, 182	14, 298, 896	45, 842	36, 352	45, 281	32, 029	32, 543	345, 514	499, 592	359, 156	236, 214	168, 580
Estimated Northern Hemisphere total	*10, 150, 000*	12, 856, 000	13, 848, 000	14, 592, 000	...	64, 159	69, 377	79, 500	63, 500	...	1, 110, 946	1, 399, 700	1, 439, 500	1, 197, 600	...
SOUTHERN HEMISPHERE															
Chile	913	793	...	...	...	16	10	...	...	...	[3] 734	73	...	...	...
Uruguay	116, 279	290, 676	401, 851	442, 765	486, 970	1, 198	3, 228	5, 056	4, 837	...	...	...	...	...	...
Argentina [6]	5, 224, 757	5, 231, 000	6, 628, 000	8, 178, 000	7, 401, 000	52, 365	50, 004	70, 264	89, 067	53, 147	...	...	...	...	...
New Zealand	8, 693	7, 757	12, 200	1, 765	...	121	141	175	26	...	...	...	...	...	...
Total Southern Hemisphere countries reporting all years	5, 341, 036	5, 521, 676	7, 029, 851	8, 620, 765	7, 887, 970	52, 365	50, 004	70, 264	89, 067	53, 147	...	...	...	...	...
Total Northern and Southern Hemisphere countries reporting all years	15, 366, 221	18, 339, 654	20, 853, 590	23, 167, 947	22, 186, 666	98, 207	86, 356	115, 545	121, 096	85, 690	345, 514	499, 592	359, 156	236, 214	168, 580
Estimated world total [7]	15, 502, 000	18, 400, 000	21, 522, 000	23, 600, 000	...	117, 863	122, 764	155, 100	157, 500	...	1, 111, 800	1, 400, 000	1, 440, 000	1, 198, 000	...

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere are combined with those of the Southern Hemisphere which immediately follow; thus, for 1930-31 the crop harvested in the Northern Hemisphere countries in 1930 is combined with the Southern Hemisphere harvest which begins late in 1930 and ends early in 1931.

[1] Preliminary.
[2] Flax and hemp.
[3] 4-year average.
[4] 2-year average.
[5] Where changes in territory have occurred averages are estimates for territory within present boundary.
[6] Acreage figures are for area sown; figures of area harvested are not available for all years, but over a 16-year period the harvested area averaged 10 per cent below the sown area.
[7] Excludes a few minor producing countries for which no statistics are available and which do not enter into world trade.

TABLE 78.—*Flaxseed: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1922–23 to 1931–32*

Year beginning July	Percentage of receipts during the crop year												
	July [1]	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1922–23	2.5	13.4	27.6	23.3	11.4	5.9	4.7	3.0	2.7	2.3	1.6	1.6	100.0
1923–24	1.1	10.0	30.7	27.3	12.1	6.0	2.6	2.3	2.0	1.5	2.1	2.3	100.0
1924–25	.5	5.3	23.0	34.5	17.8	6.7	3.8	2.7	1.8	1.4	1.2	1.3	100.0
1925–26	1.1	11.1	34.3	23.5	12.4	5.6	2.7	2.0	1.8	1.5	1.9	2.1	100.0
1926–27	1.4	12.0	25.5	32.5	11.2	6.3	2.4	2.3	1.7	.9	1.7	2.1	100.0
1927–28	1.0	6.1	32.9	33.4	10.5	5.3	3.0	1.9	1.9	1.2	1.7	1.1	100.0
1928–29	1.1	7.2	31.1	35.3	11.6	5.3	2.1	1.2	1.4	1.0	1.5	1.2	100.0
1929–30	1.9	19.0	35.6	23.9	9.1	3.3	1.3	1.1	1.0	.8	1.0	1.1	100.0
1930–31	2.2	21.3	31.4	16.5	9.0	4.3	2.6	2.5	2.0	2.3	2.1	1.8	100.0
1931–32	6.4	31.0	26.9	17.0	5.9	2.8	2.0	2.0	1.4	1.4	1.8	1.4	100.0

Bureau of Agricultural Economics.

[1] July marketings are composed of receipts of the current year's crop from Kansas, Nebraska, Iowa, and other States in the southern part of the flax belt and receipts of the previous year's crop from the Dakotas, Minnesota, and Montana.

TABLE 79.—*Flaxseed: Receipts at Minneapolis, by months, 1923–24 to 1931–32*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1923–24	1,019	2,654	1,953	1,308	877	358	250	229	210	296	296	264	9,714
1924–25	269	2,285	3,475	2,781	1,375	1,244	750	671	374	402	442	286	14,334
1925–26	1,094	3,331	2,745	1,107	722	375	276	320	357	431	360	294	11,412
1926–27	830	1,539	2,905	1,103	669	415	318	273	169	257	277	145	8,900
1927–28	441	4,465	3,894	1,065	490	716	495	471	311	439	457	143	13,387
1928–29	652	3,454	3,690	1,278	601	373	328	328	255	244	330	180	11,713
1929–30	1,249	2,939	1,759	624	403	180	116	133	142	390	313	162	8,410
1930–31	2,436	2,295	1,213	912	472	401	368	449	359	355	511	154	9,925
1931–32	2,110	1,476	840	321	264	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the Minneapolis Chamber of Commerce.

TABLE 80.—*Flaxseed: Commercial stocks, 1926–27 to 1932–33*

DOMESTIC FLAXSEED IN UNITED STATES [1]

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1926–27	------	------	------	------	2,684	2,328	2,089	2,014	1,834	1,396	1,445	909
1927–28	584	1,583	5,353	4,700	4,247	3,542	2,816	2,178	1,891	882	781	615
1928–29	317	704	2,721	1,343	1,397	1,142	780	681	547	398	434	370
1929–30	159	924	1,179	610	917	867	740	696	589	519	433	314
1930–31	467	1,903	2,202	1,431	1,371	1,357	1,273	1,205	972	784	786	672
1931–32	745	1,383	1,920	1,585	873	639	492	555	686	824	901	763
1932–33	1,596	2,668	2,095	1,150	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from weekly reports to the grain, hay, and feed market news service. Data are for stocks on the Saturday nearest the first day of the month.

[1] Includes flaxseed in store in public and private elevators in 42 important markets and also the flaxseed afloat in vessels or barges in the harbors of lake and seaboard ports. Flaxseed in transit either by rail or water, mill stocks, or small private stocks of flaxseed intended only for local purposes, not included.

TABLE 81.—*Flaxseed: International trade, average 1925–1929, annual, 1928–1931*

Country	Calendar year: Average 1925–1929, Exports	Average 1925–1929, Imports	1928, Exports	1928, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931 [1], Exports	1931 [1], Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	63,699	0	76,547	0	63,677	0	46,047	31	74,022	687
British India	9,442	763	6,835	632	10,005	876	10,455	736	4,500	0
Canada	2,828	568	2,950	300	*851*	*1,374*	1,397	809	1,045	346
Uruguay	2,084	0	2,379	0	2,201	0	3,175	0		
Lithuania	811	0	275	0	971	0	792	0	439	0
Latvia	644	560	379	706	604	682	423	305	205	161
Morocco	363	0	378	0	359	0	318	0	671	0
Eritrea [2]	188	0	107	0	20	0	20	0	37	0
China	*117*	*0*	*10*	*0*	*1*	0	23	0	*170*	*0*
Estonia	86	31	12	76	113	42	99	3	7	1
Rumania	56	9	[2] 6	[2] 0	[2] 43	44	78	0		
Tunis	47	0	64	0	39	0	25	0	15	0
Total	80,365	1,931	89,042	1,174	78,884	3,018	62,852	1,884	81,111	1,095
PRINCIPAL IMPORTING COUNTRIES										
United States	0	20,540	0	17,579	0	24,243	0	12,662	0	14,480
Netherlands	208	13,639	165	16,481	264	14,195	260	10,029	88	16,524
Germany	80	13,602	67	17,439	148	12,439	47	9,274	25	13,404
United Kingdom	0	*13,439*	0	*13,884*	0	*11,359*	0	*8,915*	0	*13,517*
France	20	7,308	15	8,272	29	8,434	27	7,499	30	10,380
Belgium	301	4,052	326	5,008	373	4,502	121	2,990	366	6,611
Italy	1	2,380	0	2,588	2	2,324	0	2,090	0	2,412
Sweden	0	1,477	0	1,652	0	1,384	0	1,425	0	1,884
Australia [2]	0	957	0	797	0	1,498	0	605		
Czechoslovakia	*10*	885	7	*956*	19	*1,112*	33	796	*12*	*1,041*
Denmark	0	696	0	857	0	576	0	643	0	745
Spain	3	663	0	918	0	748	0	749	0	832
Norway	0	602	0	648	0	578	0	637	0	515
Poland	275	522	317	851	573	818	54	267	13	488
Japan	0	464	0	681	2	626	0	224	1	330
Finland	0	222	0	241	0	314	0	141	0	123
Hungary	27	92	25	118	78	126	263	188	4	75
Austria	0	15	0	15	0	17	1	16	0	19
Total	925	81,615	922	88,985	1,488	85,293	806	59,150	539	83,380

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.

TABLE 82.—*Flaxseed: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	210.4	206.4	212.1	211.4	218.8	218.8	224.9	223.7	217.7	222.6	213.1	218.1	212.2
1924–25	210.2	201.2	210.8	222.7	235.8	271.8	275.3	267.8	244.7	251.8	246.8	227.6	219.2
1925–26	229.5	227.9	228.9	228.1	232.1	224.5	216.4	202.9	207.0	205.4	203.9	208.7	226.2
1926–27	215.7	211.3	197.5	195.5	196.4	193.0	195.7	195.1	196.1	205.7	204.7	198.4	203.1
1927–28	203.7	197.1	191.2	184.2	185.3	188.4	189.9	194.8	198.4	210.5	209.0	195.5	193.5
1928–29	181.7	181.6	198.1	198.1	206.4	211.1	218.4	219.2	216.4	214.7	217.0	233.2	194.5
1929–30	259.5	285.4	300.5	285.1	287.7	279.8	275.0	261.5	263.7	245.9	245.6	192.7	280.6
1930–31	191.9	168.1	152.2	133.6	137.6	131.7	126.2	130.4	128.6	129.9	120.1	132.6	158.1
1931–32	120.4	113.1	106.5	121.9	118.7	116.1	116.0	118.7	116.1	106.7	86.2	80.8	112.5
1932–33	79.3	88.1	87.7	87.1	82.8								

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices on first of month and first of succeeding month, August, 1922–December, 1923

TABLE 83.—*Flaxseed, No. 1: Weighted average price* [1] *per bushel of reported cash sales, Minneapolis 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	234	238	248	242	246	250	258	249	247	246	244	247	244
1924–25	244	226	240	258	284	315	312	297	279	280	268	249	263
1925–26	254	259	258	256	261	250	243	232	234	230	233	244	253
1926–27	238	233	221	222	224	223	225	222	224	234	225	223	225
1927–28	222	221	213	213	215	224	227	233	236	246	238	221	221
1928–29	205	209	228	235	239	245	255	249	245	245	248	276	229
1929–30	279	323	332	324	322	308	305	292	292	268	271	232	311
1930–31	200	190	180	165	161	157	156	158	157	155	148	164	176
1931–32	141	137	132	146	143	141	140	140	135	121	105	98	
1932–33	101	113	113	106	109								136

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record. Prices 1899–1900 to 1922–23 appear in 1932 Yearbook, Table 100.

[1] Average of daily prices weighted by car-lot sales.

TABLE 84.—*Quantity of flaxseed crushed and linseed oil produced, United States, 1919–20 to 1931–32*

Year beginning October	Flaxseed crushed					Oil produced				
	October–December	January–March	April–June	July–September	Total	October–December	January March	April–June	July–September	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1919–20	7,684	6,336	6,407	6,542	26,969	139,960	117,226	121,407	126,138	504,731
1920–21	6,341	6,343	6,332	5,812	24,828	120,502	118,787	118,687	107,716	465,892
1921–22	7,539	6,713	3,441	5,583	23,276	137,528	124,941	70,239	102,581	435,289
1922–23	8,602	8,292	8,689	8,223	33,806	158,753	155,148	178,267	154,588	646,756
1923–24	8,970	9,575	9,434	7,550	35,529	165,560	177,583	176,187	139,862	659,192
1924–25	11,530	12,516	9,128	7,822	40,996	211,954	229,544	169,980	146,306	757,784
1925–26	11,798	10,651	7,767	9,500	39,716	217,992	194,607	144,950	174,057	731,606
1926–27	11,085	11,037	8,963	9,051	40,136	206,496	202,162	167,232	169,274	745,164
1927–28	12,699	11,885	9,608	7,603	41,795	238,046	223,751	179,532	141,889	783,218
1928–29	11,191	10,839	9,962	10,321	42,313	206,273	202,353	187,019	191,977	787,622
1929–30	9,947	7,966	7,270	5,887	31,070	182,228	145,970	130,863	108,236	567,297
1930–31	7,391	6,571	7,205	7,610	28,777	131,257	118,417	130,635	141,205	521,514
1931–32 [1]	7,112	5,393	3,507	3,739	19,751	130,479	99,783	65,764	68,503	364,529

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census, "Animal and vegetable fats and oils."

[1] Preliminary.

TABLE 85.—*Linseed oil: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Netherlands	158, 136	833	155, 926	1, 187	172, 702	1, 320	172, 024	943	161, 433	952
United Kingdom	49, 400	47, 546	49, 327	50, 165	44, 925	69, 418	35, 157	97, 051	32, 258	83, 005
Belgium	23, 503	2, 303	24, 453	2, 123	29, 840	2, 917	29, 324	1, 237	22, 716	1, 518
Sweden	1, 267	668	1, 436	580	1, 751	911	1, 435	312	1, 952	469
Total	232, 306	51, 350	231, 142	54, 055	249, 218	74, 506	237, 940	99, 543	218, 359	85, 944
PRINCIPAL IMPORTING COUNTRIES										
Germany	8, 343	43, 213	10, 342	29, 188	14, 277	42, 216	9, 288	33, 931	14, 680	15, 517
Switzerland	27	13, 286	73	14, 771	27	13, 341	49	12, 981	38	19, 474
Brazil	0	9, 558	0	10, 204	0	6, 909	0	5, 758	0	4, 214
Austria	459	8, 997	510	10, 455	363	9, 148	165	9, 104	80	12, 495
France	4, 378	8, 138	4, 829	7, 033	5, 232	3, 202	11, 278	5, 480	6, 982	10, 443
United States	2, 351	7, 046	1, 965	173	2, 208	9, 961	1, 592	2, 125	1, 094	235
Finland	0	5, 380	0	6, 507	0	4, 795	0	5, 843	0	6, 648
Dutch East Indies	0	5, 161	0	5, 505	0	5, 753	0	5, 448	0	3, 895
Australia [2]	25	4, 968	19	5, 186	18	3, 031	24	1, 643	--------	--------
Egypt	3	4, 935	2	5, 054	2	4, 686	--------	1, 555	--------	697
Union of South Africa	0	4, 770	0	5, 082	0	5, 015	0	4, 442	0	5, 165
Hungary	12	4, 246	1	5, 703	0	1, 475	989	1, 225	135	823
New Zealand	2	3, 789	0	3, 667	0	3, 521	0	2, 892	0	3, 020
Italy	403	3, 574	358	7, 446	372	3, 455	244	2, 210	169	6, 436
Norway	54	3, 314	28	3, 191	168	4, 312	64	1, 703	--------	9, 188
Chile	4	2, 712	9	2, 533	11	3, 474	22	2, 605	--------	1, 931
British India	728	2, 092	576	2, 392	1, 259	1, 874	922	1, 555	358	1, 548
Denmark	419	2, 081	1, 197	2, 379	441	2, 271	3	2, 424	0	1, 795
British Malaya	128	1, 550	116	1, 961	177	1, 579	85	1, 380	77	1, 306
Bulgaria	0	1, 484	0	1, 604	0	1, 620	0	1, 353	0	1, 351
Yugoslavia	52	1, 390	31	1, 633	4	1, 080	1	1, 028	1	2, 177
Czechoslovakia	257	1, 369	11	811	1, 155	670	542	578	106	558
China	0	1, 242	0	1, 520	0	1, 476	0	903	0	1, 462
Philippine Islands	0	1, 210	0	1, 560	0	1, 636	0	1, 621	0	1, 322
Canada	49	819	53	734	18	1, 342	33	1, 109	14	1, 048
Argentina	265	743	128	653	64	746	35	646	36	488
Tunis	0	668	0	792	0	733	0	912	--------	--------
Greece	[3] 55	419	0	452	3	301	--------	263	--------	456
Total	17, 989	149, 053	20, 248	138, 189	26, 799	139, 688	25, 336	112, 717	23, 779	113, 687

Bureau of Agricultural Economics, official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] 3-year average.

TABLE 86.—*Linseed oil, raw: Average car-lot price per gallon in barrels, New York, 1923–24 to 1932–33*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	97	90	94	92	92	92	91	93	90	94	94	98	93
1924–25	102	102	102	108	110	117	116	111	104	105	106	98	107
1925–26	102	103	[1] 99	96	95	87	85	80	81	81	84	89	90
1926–27	90	83	81	81	80	79	78	77	81	84	84	80	82
1927–28	80	77	74	73	72	74	74	74	74	78	77	75	75
1928–29	73	74	76	77	75	75	76	76	76	77	79	92	77
1929–30	96	116	118	111	110	105	105	106	106	105	105	104	107
1930–31	97	78	74	70	68	66	69	71	68	66	64	68	72
1931–32	63	57	55	56	53	50	46	50	49	46	44	42	51
1932–33	41	46	47	50	52	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Oil, Paint and Drug Reporter, average of weekly ranges. Data for 1910-11 to 1922-23 are available in the 1930 Yearbook, p. 666, Table 103.

[1] *Beginning October, 1925, prices are quoted on pound basis and have been converted to price per gallon by multiplying by 7.5.*

TABLE 87.—*Linseed meal, 34 per cent protein: Average price per ton, Minneapolis, by months, 1923–24 to 1932–33*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	45.40	47.50	48.40	46.25	46.00	45.12	41.50	40.50	39.25	37.70	41.38	41.62	43.38
1924–25	44.00	43.62	45.38	44.30	46.38	47.00	44.50	39.88	38.75	41.30	43.00	43.31	43.45
1925–26	43.80	42.88	42.30	42.88	44.50	46.40	47.62	45.50	48.25	49.00	46.38	46.60	45.51
1926–27	44.81	43.12	43.70	43.88	44.00	45.60	47.35	47.75	48.10	47.25	46.90	45.50	45.58
1927–28	46.25	45.95	45.30	46.40	47.45	48.00	49.00	50.80	51.40	53.00	51.10	49.10	48.65
1928–29	45.75	47.55	53.85	54.90	57.00	56.90	59.00	56.60	52.10	51.90	51.20	53.05	53.32
1929–30	53.10	56.40	55.70	55.10	55.00	54.10	51.75	50.30	54.75	48.70	44.75	42.75	51.87
1930–31	42.20	42.10	40.25	38.90	37.90	36.40	34.65	31.60	30.75	27.70	24.95	25.60	34.42
1931–32	26.20	25.75	25.70	31.40	32.10	30.15	28.75	28.00	27.30	24.25	21.40	20.40	26.78
1932–33	21.40	22.40	21.50	19.80	19.15								

Bureau of Agricultural Economics. Compiled from reports made to the Bureau. Quoted "per ton, bagged, in car lots, sight-draft basis."

TABLE 88.—*Rice, rough: Acreage, production, value, exports, etc., United States, 1909–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Foreign trade, mostly cleaned rice, but including rice bran, meal, and broken rice, reduced to rough basis, year beginning July [1]			
						Domestic exports	Shipments from United States to Alaska, Hawaii, and Puerto Rico	Imports	Net balances [2]
	1,000 acres	*Bushels of 45 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1909	610	33.8	20,607	79.5	16,392	964	4,276	8,114	−2,581
1910	723	33.9	24,510	67.8	16,624	1,082	4,606	7,516	−1,605
1911	696	32.9	22,934	79.7	18,274	1,420	4,890	6,842	−157
1912	723	34.7	25,054	93.5	23,423	1,401	4,806	7,996	−1,332
1913	827	31.1	25,744	85.8	22,090	807	5,244	10,447	−3,756
1914	694	34.1	23,649	92.4	21,849	2,789	4,640	9,979	−419
1915	803	36.1	28,947	90.6	26,212	4,391	5,191	9,516	+2,651
1916	869	47.0	40,861	88.9	36,311	6,529	5,818	7,778	+6,167
1917	981	35.4	34,739	189.6	65,879	7,069	4,878	16,418	−1,148
1918	1,119	34.5	38,606	191.8	74,042	6,953	5,995	13,094	+7,638
1919	1,063	39.5	41,985	266.6	111,913	17,402	5,547	6,477	+19,946
1920	1,336	39.0	52,066	119.1	62,036	15,871	6,614	3,485	+21,217
1921	921	40.8	37,612	95.2	35,802	19,494	7,179	2,650	+25,952
1922	1,055	39.2	41,405	93.1	38,562	13,344	8,290	2,503	+20,308
1923	895	37.7	33,717	110.2	37,150	8,199	9,094	1,376	+16,416
1924	850	37.9	32,206	138.6	44,644	4,033	8,152	2,076	+10,687
1925	883	37.7	33,249	153.8	51,142	1,734	8,049	4,747	+5,535
1926	1,034	41.1	42,477	109.6	46,544	10,957	8,743	2,558	+17,587
1927	1,003	44.6	44,754	92.9	41,598	11,152	9,183	1,588	+19,035
1928	956	45.4	43,440	88.5	38,456	14,137	10,131	1,325	+23,403
1929	860	47.2	40,604	99.5	40,384	10,423	10,342	1,124	+19,795
1930	961	46.7	44,923	78.4	35,209	10,116	10,864	1,278	+19,829
1931	978	47.0	46,012	49.7	22,869	9,890	10,398	737	+19,653
1932 [3]	869	45.3	39,356	39.2	15,419				

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board. See 1927 Yearbook, p. 819, for data for earlier years.

[1] Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.

[2] The difference between the total exports (domestic exports plus reexports plus shipments to Alaska, Hawaii, and Puerto Rico) and total imports. Net exports indicated by +; net imports indicated by −.

[3] Preliminary.

TABLE 89.—*Rice, rough: Acreage, yield, production, and December 1 price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Price per bushel received by producers December 1	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Arkansas	175	177	150	46.6	54.0	40.0	8,097	9,558	6,900	44	37
Louisiana	472	471	424	35.6	36.5	39.0	16,944	17,102	16,536	53	41
Texas	160	205	185	38.9	52.5	48.0	6,952	10,762	8,880	54	40
California	127	125	110	54.0	68.0	64.0	6,856	8,500	7,040	44	38
United States	934	978	869	40.5	47.0	45.3	38,850	46,012	39,356	49.7	30.2

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 90.—*Rice, in terms of clean rice: World production, 1909–10 to 1932–33*

Crop year	Estimated world production, exclusive of China	Production in selected countries [1]							
		India	Japan	Indo-China	Java and Madura [2]	Siam [3]	Chosen	Philippines	United States
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
1909–10	107,000	63,869	16,474		5,723	3,734	2,343	1,164	572
1910–11	106,000	64,552	14,650		5,738	3,466	3,269	1,267	681
1911–12	109,000	63,943	16,246		6,170	4,533	3,634	717	637
1912–13	109,000	63,802	15,778	6,614	5,842	4,561	3,413	1,512	696
1913–14	*113,000*	*64,555*	*15,789*	*8,051*	*6,440*	*4,994*	*3,604*	*1,404*	*715*
1914–15	113,000	61,109	17,909	9,521	6,339	4,708	4,439	1,100	657
1915–16	124,000	73,315	17,569	7,921	6,451	4,786	4,036	1,289	804
1916–17	129,000	78,521	18,363	6,733	6,409	5,011	4,377	1,745	1,135
1917–18	132,000	80,559	17,143	6,313	7,204	5,133	4,261	2,210	965
1918–19	105,000	54,466	17,184	6,302	7,272	4,642	4,765	2,085	1,072
1919–20	123,000	71,734	19,107	6,532	7,936	3,114	3,974	2,243	1,166
1920–21	117,000	61,949	19,857	6,284	6,761	5,868	4,639	2,560	1,446
1921–22	127,000	74,240	17,335	7,931	5,964	5,806	4,500	2,681	1,045
1922–23	133,000	75,495	19,067	7,629	7,280	5,954	4,717	2,703	1,150
1923–24	118,000	63,164	17,418	7,208	7,284	6,034	4,767	2,566	937
1924–25	127,000	69,601	17,960	7,801	7,563	6,779	4,153	2,818	895
1925–26	127,000	68,851	18,766	7,951	7,184	5,752	4,641	2,949	924
1926–27	126,000	66,483	17,465	8,255	7,732	7,169	4,607	3,083	1,180
1927–28	127,000	63,244	19,510	8,850	7,951	6,261	5,435	3,082	1,243
1928–29	130,000	72,005	18,945	7,811	7,669	5,325	4,245	3,073	1,207
1929–30	127,000	69,736	18,710	8,095	7,449	5,315	4,304	3,184	1,128
1930–31 [4]	137,000	72,124	21,009	8,004	8,053	6,620	6,026	3,064	1,248
1931–32 [4]	132,000	73,405	17,346	7,773	7,732	5,581	4,987		1,278
1932–33 [4]		68,667	18,905		7,927		5,066		1,093

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. *Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere* which immediately follow; thus, for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends early in 1932. Estimates of world rice production for the period 1900–01 to 1908–09 appear in Agriculture Yearbook, 1924, p. 653.

[1] China is an important producing country, but official statistics are not available.

[2] Estimates of the production of rice on nonirrigated land are not available prior to 1916–17. Estimates for the years 1909–10 to 1915–16 as given here are for the production on irrigated land. Estimates for the years 1916–17 to 1931–32 are for the total production.

[3] Estimated figures obtained by multiplying acreage under rice as classified for revenue purposes up to 1912–13, and acreage as reported by the Department of Land and Agriculture from 1912–13 on by an average yield for the years 1920–21 to 1923–24, for which years official estimates have been published of acreage, yield, and total production.

[4] Preliminary.

TABLE 91.—*Rice: Acreage and production in specified countries, average 1921–22 to 1925–26, annual 1930–31 to 1932–33*

Country	Acreage				Production			
	Average, 1921–22 to 1925–26	1930–31	1931–32	1932–33[1]	Average, 1921–22 to 1925–26	1930–31	1931–32	1932–33[1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
United States	921	961	978	869	990	1, 248	1, 278	1, 093
Mexico	[2] 95	90	89		[2] 77	102	98	
Hawaii	[3] 3				[3] 18			
Central America, South America, and West Indies:								
Guatemala	6				3			
Salvador	[2] 13				[2] 17			
Costa Rica	[4] 18				[4] 5			
Colombia	[4] 42				[4] 21			
British Guiana	45	60			52	85		
Dutch Guiana					14	28	35	
Trinidad and Tobago	[2] 8	9			[2] 3	3		
Europe:								
Spain	115	120	113	118	376	425	362	433
Portugal	18	36	37		22	34		
Italy	316	361	359	335	729	885	901	894
Yugoslavia	4	4			3	3		
Bulgaria	11	17	14	13	14	24	19	22
French West Africa:								
French Guinea	[4] 2, 008				[4] 1, 106			
French Senegal	119	74			65	44		
Upper Volta	[2] 44				[2] 6	6		
Sierra Leone	390	297			311	373		
Egypt	192	359	67	489	295	610	98	748
Asia:								
India	81, 400	82, 706	84, 260	82, 026	70, 270	72, 124	73, 893	68, 667
Andaman and Nicobar	3				3			
British North Borneo	62	62	68		42	39		
Brunei	[2] 3				[2] 2			
French establishments in India	45				29			
Japanese Empire—								
Japan	7, 705	7, 938	7, 962	7, 976	18, 107	21, 009	17, 346	18, 905
Chosen (Korea)	3, 824	4, 073	4, 104	3, 824	4, 556	6, 026	4, 987	5, 066
Taiwan (Formosa)	1, 262	1, 515	1, 565		1, 747	2, 315	2, 350	
Kwantung	3	2			3	5		
French Indo-China	11, 949	14, 343	12, 926		7, 704	8, 004	7, 773	
Siam	5, 964	7, 189	6, 378		6, 065	6, 620	5, 581	
Federated Malay States	197				124			
Unfederated Malay States	407				284			
Straits Settlements	72				75			
Philippine Islands	4, 229	4, 425			2, 744	3, 064		
Ceylon	799				471			
SOUTHERN HEMISPHERE								
Brazil	[5] 1, 029				[5] 1, 033	1, 426		
Argentina	16	12			19			
Belgian Congo	27				6			
Madagascar	[5] 1, 298	1, 354	1, 285		[5] 1, 322	895	1, 055	
Java and Madura	8, 014	8, 812	8, 679	9, 105	7, 055	8, 053	7, 732	7, 927
Fiji Islands	11				10			
Estimated world total excluding China					126, 000	137, 000	132, 000	

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere countries are combined with those of the Southern Hemisphere which immediately follow; thus, for 1930–31 the crop harvested in the Northern Hemisphere countries in 1930 is combined with the Southern Hemisphere harvest which begins late in 1930 and ends early in 1931.

[1] Preliminary.
[2] 3-year average.
[3] 1 year only.
[4] 2-year average.
[5] 4-year average.

TABLE 92.—*Rice, rough: Receipts at mills in Texas, Louisiana, Arkansas, and Tennessee, by months, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 bbls.	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*	*1,000 bbls.*
1923–24	177	394	1,512	1,911	966	1,076	580	370	80	14	9	6	7,095
1924–25	208	949	2,182	1,905	973	448	197	43	34	11	45	8	7,003
1925–26	457	853	925	1,131	1,672	1,019	477	210	194	119	106	74	7,237
1926–27	188	1,147	1,381	1,253	1,053	818	648	621	372	396	430	147	8,754
1927–28	530	1,167	1,719	1,266	831	853	805	942	620	352	130	17	9,232
1928–29	180	1,197	2,113	1,936	947	621	592	439	429	232	191	126	9,003
1929–30	584	1,388	2,330	1,416	797	870	961	284	146	172	48	21	9,017
1930–31	481	1,005	2,063	1,246	867	1,147	664	601	566	520	323	172	9,855
1931–32	228	1,442	1,810	1,408	632	569	734	813	590	702	328	218	9,483
1932–33	266	862	1,606	1,189									

Bureau of Agricultural Economics. Computed from monthly reports of the Rice Millers' Association and from reports of nonassociation mills. A barrel of rice is equivalent to 162 pounds of rough rice.

TABLE 93.—*Rice, including flour, meal and broken rice: International trade average 1925–1929, annual 1928–1931*

Country	Calendar year: Average 1925–1929 Exports	Average 1925–1929 Imports	1928 Exports	1928 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL EXPORTING COUNTRIES	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
British India	4,888	224	4,024	553	4,600	194	5,802	160	[2] 4,823	104
Indo China	*3,493*	*0*	*3,885*	*0*	*3,208*	*0*	*2,451*	*0*		*0*
Siam [3]	3,101	1	3,280	0	2,514	0	2,281	0		
Italy	429	3	424	7	388	6	468	13	334	5
United States	252	60	379	37	386	31	259	28	274	31
Spain	115	0	131	0	80	0	125	0	83	0
Egypt	103	59	168	31	163	36	112	26	63	55
Madagascar	41	0	25	0	16	0	14	0	13	0
Total	12,422	347	12,325	628	11,361	267	11,572	227	5,590	255
PRINCIPAL IMPORTING COUNTRIES										
China	6	2,024	4	1,688	4	1,443	4	2,652	4	1,432
British Malaya	623	1,930	659	2,091	545	2,079	490	2,106	412	1,817
Dutch East Indies	51	1,303	30	1,289	28	1,621	27	1,385	38	1,342
Ceylon	*0*	*1,048*	*0*	*1,091*	[4] *0*	*1,100*	[4] *0*	*1,063*	*0*	*1,017*
Japan	14	961	9	623	8	401	97	397	326	277
Germany	325	848	280	883	256	658	159	550	137	896
France	169	532	256	631	217	562	190	534	94	648
Cuba	0	461	0	514	0	453	0	443	0	
Netherlands	224	272	187	225	211	246	216	242	258	333
United Kingdom	16	269	15	280	13	258	14	254	11	257
Philippine Islands	1	147	2	97	1	232	1	24	2	27
Argentina	0	139	0	117	0	146	0	159	0	116
Russia	0	126	0	106	1	90	1	92	2	77
Mauritius	0	129	0	141	0	121	0	114	0	
Czechoslovakia	0	112	0	116	0	107	0	98	0	113
Belgium	4	91	4	102	5	87	1	105	20	135
Total	1,433	10,422	1,446	9,994	1,289	9,604	1,200	10,218	1,304	8,487

Bureau of Agricultural Economics. Official sources except where otherwise noted. Mostly cleaned rice. Under rice is included paddy, unhulled, rough, cleaned, polished, broken, and cargo rice, in addition to rice flour and meal. Rice bran is not included. Rough rice, or paddy, where specifically reported, has been reduced to terms of cleaned rice at the ratio of 162 pounds of rough or unhulled to 100 pounds of cleaned. "Rice, other than whole or cleaned rice," in the returns of the United Kingdom is not considered paddy, since the chief sources of supply indicate that it is practically all hulled rice. Cargo rice, a mixture of hulled and unhulled, is included without being reduced to terms of cleaned. Broken rice and rice flour and meal, are taken without being reduced to terms of whole cleaned rice.

[1] Preliminary.
[2] Includes, 9 months land trade.
[3] Year ended Mar. 31 of following year.
[4] International Yearbook of Agricultural Statistics.

TABLE 94.—*Rice, Blue Rose, clean:*[1] *Average wholesale price per 100 pounds, New Orleans, 1923–24 to 1931–32*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	3.78	4.00	4.88	4.66	4.38	4.62	4.69	5.06	5.06	5.88	6.12	6.19	4.94
1924–25	5.88	5.69	5.12	5.50	6.10	6.30	6.50	6.38	6.34	6.50	6.81	6.88	6.17
1925–26	6.02	6.31	5.69	6.34	6.41	6.31	6.59	6.25	6.19	5.60	5.94	5.94	6.18
1926–27	4.94	5.62	4.81	4.44	4.38	4.50	4.19	4.34	4.06	4.12	4.52	4.22	4.51
1927–28	4.12	4.12	3.84	3.62	3.69	3.75	3.68	3.62	3.50	4.12	4.28	4.12	3.87
1928–29	4.12	------	3.91	3.81	3.94	4.12	3.88	3.88	3.88	3.75	3.81	3.94	------
1929–30	4.25	3.72	3.78	3.88	3.84	4.00	4.12	4.31	4.31	4.56	4.31	4.31	4.12
1930–31	4.06	4.12	3.75	3.50	3.46	3.25	3.44	3.31	3.44	3.22	3.00	3.13	3.47
1931–32	3.28	2.94	2.56	2.81	2.75	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the New Orleans Board of Trade.

[1] The term "clean" is equivalent to "milled."

TABLE 95.—*Buckwheat: Acreage, production, value, exports, etc., United States, 1919–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Foreign trade, including flour, year beginning July [1]		
						Domestic exports	Imports	Net balance [2]
	1,000 acres	*Bushels of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1919	*743*	*17.1*	*12,690*	------	------	------	------	------
1919	713	17.3	12,327	145.9	17,984	245	160	+85
1920	714	16.7	11,924	127.1	15,153	399	336	+63
1921	638	18.5	11,777	80.9	9,532	485	113	+372
1922	728	16.2	11,776	88.2	10,385	172	286	−114
1923	692	16.9	11,662	93.2	10,870	92	322	−230
1924	*717*	*16.8*	*12,004*	------	------	------	------	------
1924	737	17.0	12,508	102.4	12,806	191	546	−355
1925	742	16.9	12,540	88.6	11,116	79	88	−9
1926	683	16.2	11,079	88.1	9,764	66	86	−20
1927	758	16.8	12,766	82.9	10,583	554	74	+480
1928	672	15.0	10,069	86.7	8,727	229	79	+150
1929	*692*	*13.4*	*8,359*	------	------	------	------	------
1929	627	13.9	8,692	[3] 96.3	[4] 8,367	22	171	−149
1930	573	12.1	6,960	[3] 78.9	[4] 5,493	85	426	−341
1931	505	17.6	8,890	[3] 42.3	[4] 3,764	524	14	+510
1932 [5]	464	14.8	6,844	[3] 39.6	[4] 2,713	------	------	------

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. See 1927 Yearbook, p. 825, for data for earlier years.

[1] Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932 and official records of the Bureau of Foreign and Domestic Commerce. Buckwheat—imports for consumption, 1909–1924—general imports, 1925–1932; buckwheat flour imports for consumption 1909–1932. Buckwheat flour converted to terms of grain on the basis that 1 barrel of flour is the product of 7 bushels of grain.

[2] The difference between total exports (domestic exports plus reexports) and total imports. Net exports indicated by +; net imports indicated by —.

[3] Weighted average price for crop marketing season.

[4] Based on weighted average price for crop marketing season.

[5] Preliminary.

Table 96.—*Buckwheat: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932[1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Cents*	*Cents*
Maine	13	9	13	22.5	17.5	21.0	297	158	273	59.0	48.0
Vermont	2	2	2	*22.0*	*18.0*	*22.0*	*47*	*38*	44	*58.0*	*42.0*
New York	199	158	*149*	*18.0*	18.0	*16.5*	3,644	2,844	2,458	*41.0*	*39.0*
New Jersey	2	1	1	19.4	21.0	21.0	39	21	21	42.0	49.0
Pennsylvania	201	162	138	18.8	21.5	15.0	3,767	3,483	2,070	40.0	39.0
North Atlantic	417	332	303	18.5	19.7	10.1	7,694	6,542	4,866	41.0	39.6
Ohio	25	24	20	19.0	21.0	13.5	444	504	270	42.0	38.0
Indiana	14	17	17	13.4	14.0	14.0	178	238	238	43.0	37.0
Illinois	5	4	4	15.0	12.5	14.5	76	50	58	55.0	42.0
Michigan	45	18	20	13.0	10.0	14.5	574	180	290	47.0	35.0
Wisconsin	24	11	12	12.8	10.0	11.5	318	110	138	48.0	41.0
Minnesota	80	31	25	11.7	8.5	9.0	911	264	225	32.0	27.0
Iowa	7	2	3	14.8	9.0	14.0	102	18	42	59.0	41.0
Missouri	1	1	1	11.6	10.0	12.0	11	10	12	60.0	43.0
North Dakota	14	9	4	11.9	6.0	5.0	186	54	20	30.0	25.0
South Dakota	18	6	4	11.7	5.0	7.5	223	80	30	29.0	25.0
Nebraska	1	1	1	11.2	8.5	8.5	11	8	8	55.0	25.0
North Central	234	124	111	13.5	11.8	12.0	3,033	1,406	1,331	41.6	35.5
Delaware	2	1	1	11.5	13.0	10.0	18	13	10	43.0	45.0
Maryland	7	7	5	19.8	22.0	17.5	147	154	88	48.0	40.0
Virginia	17	13	15	13.5	15.1	10.0	237	196	150	52.0	47.0
West Virginia	28	20	21	18.4	20.5	15.0	506	410	315	56.0	52.0
North Carolina	*6*	4	4	*13.0*	*15.0*	*11.0*	*85*	*60*	44	*55.0*	*52.0*
South Atlantic	61	45	46	16.4	18.5	13.2	992	833	607	53.4	48.8
Kentucky	4	2	2	10.2	11.0	10.0	46	22	20	50.0	49.0
Tennessee	*2*	*2*	*2*	*14.1*	*13.5*	*10.0*	*27*	*27*	*20*	*60.0*	*50.0*
South Central	6	4	4	11.4	12.2	10.0	73	49	40	55.1	50.0
United States	718	505	464	16.8	17.6	14.8	11,792	8,890	6,844	42.3	39.6

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

Table 97.—*Buckwheat: Estimated average price per bushel received by producers, United States, 1922–23 to 1932–33*

Crop year	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1922–23	85.2	82.2	84.4	89.0	88.5	88.6	92.6	95.0	98.4	102.3	101.4	99.4	89.9
1923–24	96.6	94.2	93.4	94.7	92.7	92.5	94.7	93.6	97.0	96.5	104.5	123.9	96.3
1924–25	118.8	107.1	106.8	104.6	107.0	112.2	112.4	104.1	113.3	112.3	115.7	110.0	108.6
1925–26	*101.2*	*87.6*	*86.7*	*87.9*	*85.7*	*80.9*	*81.7*	*82.5*	*85.0*	*90.1*	*89.9*	*93.7*	*87.5*
1926–27	90.4	86.5	83.6	83.5	83.6	84.6	86.0	85.1	88.1	98.8	101.0	98.1	87.0
1927–28	92.3	82.9	79.4	81.0	82.0	85.2	90.2	94.8	102.3	103.0	108.0	98.1	87.6
1928–29	92.6	84.5	84.8	88.7	91.2	94.3	94.1	96.4	96.5	94.7	100.4	99.6	90.7
1929–30	*96.6*	*95.8*	*95.6*	*95.9*	*97.3*	*95.8*	*94.9*	*94.8*	*95.7*	*100.0*	*98.3*	*97.4*	*96.3*
1930–31	97.1	90.7	82.8	80.0	79.1	76.6	77.4	75.2	73.2	72.6	70.0	59.2	79.6
1931–32	52.4	40.2	41.2	41.9	42.1	40.9	41.7	41.4	40.9	42.3	44.2	44.3	42.3
1932–33	43.0	40.3	39.0	38.3									

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by average monthly marketings. Mean of prices reported on 1st of month and 1st of succeeding month, September, 1922–December, 1923.

TABLE 98.—*Sorghums* [1] *cut for grain, forage, and all purposes: Acreage, production, value, United States, 1919–1932*

Year	For grain: Acreage	For grain: Yield per acre	For grain: Production	For forage: Acreage	For forage: Yield per acre	For forage: Production	For all purposes: Acreage	For all purposes: Equivalent yield per acre	For all purposes: Equivalent production on total acreage	Price per bushel received by producers Dec. 1 [2]	Farm value, basis Dec. 1, farm price
	1,000 acres	*Bus.*	*1,000 bus.*	*1,000 acres*	*Short tons*	*1,000 short tons*	*1,000 acres*	*Bus.*	*1,000 bus.*	*Cents*	*1,000 dollars*
1919	*3,726*	*19.8*	*73,654*								
1919	3,630	20.4	73,950	2,665	1.67	4,438	6,295	19.4	122,350	127.4	155,889
1920	4,027	21.8	87,732	2,513	1.78	4,479	6,540	20.9	136,385	93.8	127,976
1921	3,700	19.2	70,947	2,424	1.57	3,794	6,124	18.3	112,288	39.2	44,068
1922	3,369	14.7	49,523	2,127	1.37	2,917	5,496	13.7	75,530	87.3	65,942
1923	4,204	14.7	61,648	2,150	1.40	3,015	6,354	13.9	88,466	93.5	82,674
1924	*3,526*	*16.6*	*58,700*								
1924	3,506	16.7	58,454	2,184	1.40	3,050	5,690	15.5	87,920	85.5	75,140
1925	3,887	14.2	55,236	2,385	1.29	3,076	6,272	13.1	82,244	75.1	61,748
1926	4,211	16.8	70,869	2,229	1.32	2,950	6,440	15.8	101,502	54.2	55,007
1927	4,270	17.0	72,736	2,452	1.47	3,613	6,722	16.0	107,276	62.7	67,261
1928	4,121	17.8	73,425	2,406	1.48	3,566	6,527	17.1	111,702	61.5	68,751
1929 [3]	*3,522*	*13.9*	*49,100*								
1929	3,467	14.2	49,399	2,664	1.37	3,654	6,131	13.2	81,041	[4] 66.8	[5] 54,173
1930	3,449	10.8	37,203	3,137	1.17	3,678	6,586	9.8	64,416	[4] 56.2	[5] 36,220
1931	4,504	15.6	70,038	2,652	1.32	3,491	7,156	14.7	105,214	[4] 25.6	[5] 26,978
1932 [6]	*4,543*	*14.3*	*65,053*	*3,307*	*1.37*	*4,516*	*7,850*	*13.5*	*105,871*	[4] *19.1*	[5] *20,274*

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Revised, 1919 to 1928. See introductory text.

[1] Kafirs, milo, feterita, durra, etc.
[2] From 1919 to 1924, Nov. 15 price.
[3] Includes sweet sorghum seed.
[4] Weighted average price for crop marketing season.
[5] Based on weighted average price for crop marketing season.
[6] Preliminary.

TABLE 99.—*Sorghums:* [1] *Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State	Acreage for all purposes: Average, 1924–1928	Acreage for all purposes: 1931	Acreage for all purposes: 1932 [3]	Equivalent yield per acre: Average, 1919–1928	Equivalent yield per acre: 1931	Equivalent yield per acre: 1932	Production for all purposes [2]: Average, 1924–1928	Production for all purposes [2]: 1931	Production for all purposes [2]: 1932 [3]	Weighted average price per bushel, crop marketing season: 1931	Weighted average price per bushel, crop marketing season: 1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bus.*	*Bus.*	*Bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*Cents*	*Cents*
Missouri	77	80	86	15.6	15.5	16.5	1,114	1,240	1,419	31	50
Nebraska	24	15	22	16.4	14.5	15.0	378	218	330	30	30
Kansas	1,327	1,107	1,328	16.0	15.5	13.0	20,775	17,158	17,264	24	18
Oklahoma	*1,463*	*1,443*	*1,602*	*13.1*	*10.0*	*9.5*	*17,861*	*14,430*	*15,219*	24	*18*
Texas	2,855	3,871	4,065	18.0	15.5	15.5	48,341	60,000	63,008	26	18
Colorado	234	191	206	12.2	11.0	6.0	2,235	2,101	1,236	20	16
New Nexico	240	356	392	19.7	22.0	9.6	4,463	7,832	3,763	22	18
Arizona	25	24	28	24.1	27.0	26.0	594	648	728	44	33
California	85	69	121	27.5	23.0	24.0	2,368	1,587	2,904	58	40
United States	6,330	7,156	7,850	16.4	14.7	13.5	98,129	105,214	105,871	25.6	19.1

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Kafirs, milo, feterita, durra, etc.
[2] Includes grain equivalent on forage acreage.
[3] Preliminary.

TABLE 100.—*Grain sorghums:* [1] *Receipts at Kansas City, 1923–24 to 1932–33*

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1923–24	195	350	465	579	398	340	274	262	250	106	63	103	3,385
1924–25	647	1,152	683	636	497	320	301	440	221	183	68	24	5,172
1925–26	279	629	416	290	261	211	290	469	162	94	136	97	3,334
1926–27	397	493	626	442	293	216	192	241	249	285	79	112	3,625
1927–28	410	905	696	519	592	392	323	343	224	87	51	236	4,778
1928–29	449	675	856	525	705	428	394	668	207	196	97	182	5,380
1929–30	294	626	296	447	327	296	202	179	68	42	52	34	2,893
1930–31	299	239	162	145	130	139	100	204	41	38	31	134	1,671
1931–32	257	76	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Compiled from annual statistical reports of Kansas City Board of Trade.

[1] Includes kafir corn, milo maize, and feterita. Quoted as kafir in Table 117, 1927 Yearbook. Receipts for 1909–10 to 1922–23 available in 1931 Yearbook, p. 670, Table 131.

TABLE 101.—*Grain sorghums: Classification of receipts graded by licensed inspectors, all inspection points, total of all classes under each grade, 1925–26 to 1931–32*

Year beginning July	Grade					
	No. 1	No. 2	No. 3	No. 4	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1925–26	312	4,158	5,796	1,639	495	12,400
1926–27	878	7,180	6,674	1,792	691	17,215
1927–28	1,175	9,885	8,125	3,143	965	23,293
1928–29	866	7,247	5,400	6,794	3,969	24,276
1929–30	557	5,495	4,043	3,664	1,722	15,481
1930–31	224	2,368	2,432	1,240	390	6,654
1931–32	1,256	11,556	3,197	944	597	17,550

Bureau of Agricultural Economics. 1 car equivalent to 1,250 bushels.

TABLE 102.—*Kafir, No. 2 White: Weighted average price* [1] *per bushel of reported cash sales, Kansas City, 1923–24 to 1932–33*

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	(2)	71	(2)	68	67	73	62	85	94	(2)	113	89	-----
1924–25	88	98	109	103	93	92	97	105	113	116	107	100	101
1925–26	82	77	77	72	68	70	69	70	79	76	74	71	73
1926–27	64	64	63	63	65	69	79	102	110	97	(2)	70	-----
1927–28	69	71	74	81	88	90	92	91	92	83	89	83	82
1928–29	78	74	75	80	71	71	71	74	89	90	105	81	77
1929–30	77	73	76	72	77	91	91	94	92	101	98	(2)	-----
1930–31	63	61	58	53	53	59	58	57	51	42	42	36	55
1931–32	40	33	34	31	32	32	31	(2)	32	36	34	25	-----
1932–33	28	25	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Compiled from Kansas City Grain Market Review, formerly Daily Price Current. Quoted per 100 pounds; converted to bushels of 56 pounds. Data for 1909–10 to 1922–23 available in 1930 Yearbook, Table 123.

[1] Average of daily prices weighted by car-lot sales. [2] No quotations.

TABLE 103.—*Cotton: Acreage, production, value, exports, etc., United States, 1890–1932*

Year	Acreage in cultivation July 1	Acreage harvested	Average yield per acre	Production[1]	Price per pound received by producers Dec. 1	Farm value, basis Dec. 1 farm price	Market price[2] per pound, year beginning Aug.: New York	Market price[2] per pound, year beginning Aug.: New Orleans	Domestic exports, year beginning Aug.[3,4,5]	Imports, year beginning Aug.[4,6]	Net exports, year beginning Aug.[3,4,6,7]
	1,000 acres	*1,000 acres*	*Lbs.*	*1,000 bales*	*Cents*	*1,000 dollars*	*Cents*	*Cents*	*1,000 bales*	*1,000 ales*	*1,000 bales*
1890		19,512	187.0	8,674	8.6	313,360	9.48	9.08	5,859	45	5,815
1891		19,059	179.4	9,018	7.2	247,633	7.68	7.28	5,888	61	5,827
1892		15,911	209.2	6,664	8.3	277,194	8.45	8.15	4,456	90	4,367
1893		19,525	149.9	7,493	7.0	204,983	7.75	7.30	5,309	58	5,253
1894		23,688	195.3	9,476	4.6	212,335	6.38	5.86	7,010	104	6,908
1895		20,185	155.6	7,161	7.6	238,503	8.10	7.68	4,710	115	4,598
1896		23,273	184.9	8,533	6.7	286,169	7.71	7.28	6,172	119	6,055
1897		24,320	182.7	10,898	6.7	296,816	6.40	5.84	7,757	102	7,656
1898		24,967	220.6	11,189	5.7	315,449	6.00	5.46	7,662	105	7,557
1899		*24,275*		*9,345*							
1899		24,327	183.8	*9,345*	7.0	326,215	8.36	8.03	6,228	140	6,091
1900		24,933	194.4	*10,123*	9.2	463,310	9.38		6,800	109	6,692
1901		26,774	170.0	*9,510*	7.0	334,088	8.73	8.40	6,949	202	6,750
1902		27,175	187.3	*10,631*	7.6	403,718	9.96	9.64	7,084	151	6,936
1903		27,052	174.3	*9,851*	10.5	516,763	12.84	12.49	6,207	103	6,107
1904		31,215	205.9	*13,438*	9.0	603,438	9.09	8.70	8,908	129	8,781
1905		27,110	186.6	*10,575*	10.8	569,791	11.30	10.97	7,118	144	6,980
1906		31,374	202.5	*13,274*	9.6	635,534	11.24	10.92	8,943	227	8,741
1907		29,660	179.1	*11,107*	10.4	575,226	11.53	11.41	7,668	153	7,518
1908	[8] 33,370	32,444	194.9	*13,242*	8.7	575,092	10.23	9.80	8,955	181	8,778
1909		*32,044*		*10,005*							
1909	[8] 32,292	30,938	154.2	*10,005*	13.9	697,681	14.66	14.33	6,353	170	6,194
1910	[8] 33,418	32,403	170.7	*11,609*	14.1	820,407	14.87	14.65	8,027	245	7,787
1911	[8] 36,681	36,045	207.7	*15,693*	8.8	687,888	10.85	10.85	11,116	233	10,885
1912	[8] 34,766	34,283	190.9	*13,703*	11.9	817,055	12.29	12.20	9,146	249	8,899
1913	[8] 37,458	37,089	182.0	*14,156*	12.2	862,708	13.21	13.12	9,508	273	9,251
1914	[8] 37,406	36,832	209.2	*16,135*	6.8	549,036	[9] 8.89		8,702	400	8,322
1915	[8] 32,107	31,412	170.3	*11,192*	11.3	631,460	11.98	11.68	6,113	458	5,673
1916	[8] 36,052	34,985	156.6	*11,450*	19.6	1,122,295	19.28	18.84	5,525	311	5,219
1917	[8] 34,925	33,841	159.7	*11,302*	27.7	1,566,198	29.68	28.96	4,402	231	4,175
1918	[8] 37,207	36,008	159.6	*12,041*	27.6	1,663,633	31.01	29.87	5,774	211	5,568
1919		*33,740*		*11,421*							
1919	[8] 35,133	33,566	161.5	*11,421*	35.6	2,034,558	38.29	38.21	6,707	732	5,993
1920	[8] 37,043	35,878	178.4	*13,440*	13.9	933,658	17.89	16.55	5,973	237	5,753
1921	[8] 31,678	30,509	124.5	*7,954*	16.2	643,933	18.92	17.92	6,348	380	5,980
1922	[8] 34,016	33,036	141.2	[10] *9,755*	23.5	1,160,968	26.24	25.94	5,007	492	4,536
1923	[8] 38,701	37,123	130.6	*10,140*	31.0	1,571,829	31.11	30.33	5,815	306	5,530
1924		*39,204*		*13,628*							
1924	[8] 42,641	41,360	157.4	*13,628*	22.6	1,540,884	24.74	24.21	8,240	328	7,923
1925	[8] 48,090	46,053	167.2	*16,104*	18.2	1,464,032	20.53	19.71	8,267	340	7,939
1926	[8] 48,730	47,087	182.6	*17,977*	10.9	982,736	15.15	14.74	11,299	419	10,900
1927	41,905	40,138	154.5	*12,955*	19.6	1,269,885	20.42	19.98	7,859	354	7,524
1928	46,946	45,341	152.9	*14,478*	[11] 18.0	[12] 1,302,110	19.73	18.98	8,419	479	7,957
1929		*43,227*		*14,825*							
1929	47,067	45,793	155.0	*14,828*	[11] 16.8	[12] 1,245,104	16.60	16.16	7,035	395	6,650
1930	46,078	45,091	147.9	*13,932*	[11] 9.5	[12] 659,032	10.38	10.08	7,133	112	7,029
1931	41,189	40,693	201.2	*17,096*	[11] 5.7	[12] 483,582	6.34	6.20	9,191	130	9,087
1932[13]	38,227	37,589	162.1	12,727	[11] 6.2	[12] 397,295					

Bureau of Agricultural Economics; italic figures are census returns; other acreage, yield, and production figures are estimates of the Crop Reporting Board; acreage revised on census basis.

[1] 500-pound gross weight bales from 1899–1932.

[2] New York prices 1890–1899 from the Commercial and Financial Chronicle; beginning 1900 from reports of the New York Cotton Exchange except Sept. 23–Nov. 16, 1914, when the exchange was closed (prices for this period from the Commercial and Financial Chronicle). New Orleans prices were from same sources prior to Aug. 16, 1915, since which date from reports of the New Orleans Cotton Exchange direct to this bureau.

[3] Excluding linters from 1914 to 1920.

[4] Compiled from Commerce and Navigation of the United States, 1890–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June and July, 1919–1932, and January, 1927–1932.

[5] Bales of 500 pounds gross weight.

[6] Bales of 478 pounds net, which are equivalent to bales of 500 pounds gross weight.

[7] Total exports (domestic plus foreign) minus imports.

[8] Acreage in cultivation June 25.

[9] Average for 9 months only. Exchange closed August 1–Nov. 17, on account of war.

[10] Cotton grown in the United States. Excludes about 7,000 bales Lower California cotton ginned in the United States. Small quantities of such cotton were included in census ginning reports in some prior years.

[11] Weighted average price for crop marketing season.

[12] Based on weighted average price for crop marketing season.

[13] Preliminary.

TABLE 104.—*Cotton: Acreage, yield, production of lint in 500-pound gross-weight bales, and weighted average price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production [1]			Weighted average price per pound, crop marketing season	
	Average, 1924–1928	1931	1932	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [2]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*Cents*	*Cents*
Missouri	414	348	390	249	397	350	[3] 194	289	285	4.83	6.30
Virginia	88	70	74	246	289	181	44	42	28	5.06	6.10
North Carolina	1,919	1,333	1,373	255	271	223	967	756	640	5.97	6.60
South Carolina	2,485	1,960	1,842	175	245	180	832	1,005	695	6.05	6.50
Georgia	3,548	3,431	2,985	134	194	135	[3] 1,158	1,393	845	5.83	6.40
Florida	89	118	91	106	175	79	[3] 28	43	15	5.49	6.40
Tennessee	1,077	1,115	1,104	182	255	195	[3] 421	[3] 594	450	5.33	6.10
Alabama	3,382	3,307	3,159	146	200	141	[3] 1,228	1,420	930	5.04	6.30
Mississippi	3,514	4,032	3,830	176	209	144	1,562	1,761	1,150	6.16	6.50
Arkansas	3,470	3,566	3,530	167	256	171	[3] 1,298	1,907	1,260	5.52	6.10
Louisiana	1,800	1,958	1,801	152	220	162	694	900	610	5.57	6.40
Oklahoma	4,319	3,395	3,123	153	178	166	1,443	1,261	1,080	5.06	5.70
Texas	17,415	15,469	13,922	135	165	153	[3] 4,840	[3] 5,320	4,445	5.57	6.20
New Mexico	108	117	112	[4] 288	412	325	[3] 71	[3] 101	76	5.76	6.50
Arizona	170	176	113	291	313	347	[3] 118	115	82	7.37	7.70
California	161	192	123	293	440	490	119	177	126	6.15	6.80
All other	37	16	17	[4] 188	363	286	[3] 14	[3] 12	10	5.29	6.08
United States	*43,996*	*40,693*	*37,589*	*155.1*	*201.2*	*162.1*	*15,028*	*17,096*	*12,727*	*5.66*	*6.24*
Lower California (old Mexico)	137	69	27	------	182	230	72	26	13	------	------
Linters, total United States [5]	------	------	------	------	------	------	1,094	1,067	------	------	------

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Compiled from reports of the Bureau of the Census.
[2] Preliminary estimate of the Department of Agriculture.
[3] Slight differences from census figures on ginnings are due to ginnings in one State of cotton grown in another.
[4] 7-year average.
[5] Year beginning Aug. 1.

TABLE 105.—*Cotton: Acreage and production in specified countries—Average 1925–26 to 1929–30, annual 1930–31 to 1932–33*

Country	Year beginning August							
	Acreage				Production			
	Average, 1925–26 to 1929–30	1930–31	1931–32	1932–33 [1]	Average, 1925–26 to 1929–30	1930–31	1931–32	1932–33 [1]
	Acres	*Acres*	*Acres*	*Acres*	*Bales* [2]	*Bales* [2]	*Bales* [2]	*Bales* [2]
United States	44,882,000	45,091,000	40,693,000	37,589,000	[3] 15,268,000	[3] 13,932,000	[3] 17,096,000	[3] 12,994,000
Mexico	471,632	390,280	319,041	187,561	252,805	177,506	210,226	94,835
Venezuela	----------	----------	----------	----------	[4] 33,095	----------	----------	----------
Colombia	49,273	[5] 34,594	----------	----------	14,305	[5] 10,000	9,224	----------
Peru	305,032	----------	----------	----------	244,627	----------	----------	----------
Ecuador	----------	----------	----------	----------	5,776	12,400	----------	----------
Brazil	1,262,350	1,613,563	----------	----------	542,133	470,000	570,000	348,000
Bolivia	[6] 5,601	----------	----------	----------	[4] 2,139	----------	----------	----------
Paraguay	[6] 23,691	----------	----------	----------	[4] 12,328	18,449	13,836	----------
Argentina	243,401	----------	----------	----------	114,400	----------	----------	----------
Guatemala	697	----------	----------	----------	399	----------	----------	----------
Haiti	129,675	200,151	----------	----------	22,323	----------	----------	----------
Dominican Republic	----------	----------	----------	----------	[4] 351	----------	----------	----------
Puerto Rico	10,020	20,000	8,402	----------	2,030	3,713	----------	----------
Salvador	----------	----------	----------	----------	[4] 774	----------	----------	----------
British West Indies	16,807	20,700	----------	----------	4,288	5,000	----------	----------
Italy	[4] 8,772	9,000	2,000	3,000	[7] 3,300	4,000	1,000	1,000

See footnotes at end of table.

TABLE 105.—*Cotton: Acreage and production in specified countries—Average 1925–26 to 1929–30, annual 1930–31 to 1932–33*—Continued

Country	Year beginning August							
	Acreage				Production			
	Average, 1925–26 to 1929–30	1930–31	1931–32	1932–33 [1]	Average, 1925–26 to 1929–30	1930–31	1931–32	1932–33 [1]
	Acres	*Acres*	*Acres*	*Acres*	*Bales* [2]	*Bales* [3]	*Bales* [3]	*Bales* [2]
Yugoslavia	1,763	3,227			392	622		
Greece	39,819	36,203	45,882	49,400	15,016	10,397	12,000	
Bulgaria	10,867	13,558	13,000	30,000	3,046	4,477	5,000	11,000
Malta	993	499			427	245		
Spain	14,259	45,353	14,000	20,000	2,974	7,431	3,000	4,000
Algeria	15,138	10,223	3,000		6,176	5,161	1,000	
Morocco (French)	1,480	667			448			
French West Africa:								
Dahomey					4,749	5,848		
Ivory Coast	[6] 149,376	168,510			7,312	9,436		
French Guinea	[4] 18,841				[4] 2,176			
Senegal	47,690	8,649			2,270	565		
French Sudan	[6] 158,267	198,916			7,947	12,637		
Upper Volta					5,776	4,441		
French Togo					7,732			
Nigeria					28,846	16,402	20,000	
French Equatorial Africa		50,000			[6] 1,583	5,543	9,205	
Egypt	1,828,000	2,162,000	1,747,000	1,135,000	1,587,000	1,715,000	1,288,000	950,000
Anglo-Egyptian Sudan	281,406	387,227	335,858	330,323	126,136	106,471	205,991	
Italian Somaliland	15,862	18,533	15,000		4,733	3,459	6,142	
Niger Territory	[4] 16,610	18,681			1,688	1,153		
Eritrea	[4] 6,487	7,000	7,000	5,000	1,642	2,000	2,000	2,000
Gold Coast					[4] 209			
Belgian Congo	[4] 24,850				25,587			
Kenya					1,342	670		
Uganda	615,216	740,000	866,000	1,070,000	*131,254*	158,000	163,000	
Angola	[4] 21,466				2,773			
Tanganyika	[7] 149,990		112,240		20,537	19,360	11,656	
Nyasaland	[4] 23,805	39,934			4,360	7,806		
Rhodesia, Northern	2,566				126			
Rhodesia, Southern	16,715	8,979	5,115		1,410	1,818	1,046	
Mozambique	[4] 35,174		[5] 60,000		9,167			
Union of South Africa	66,080	31,370			11,318	6,798	2,780	
Cyprus	*11,342*	*18,542*			*2,532*	*3,999*		
Ceylon	1,570				192			
Turkey (Asiatic)	334,230				93,938	73,970	136,787	
Syria and Lebanon	54,977	60,000	75,000	25,000	9,961	12,397	17,000	
Russia [8]	*1,991,000*	*3,911,000*	*5,346,000*	*5,600,000*	*1,012,000*	*1,589,000*	*1,851,000*	*1,950,000*
Iraq	[7] 15,000	6,500			2,977	2,625	808	418
Persia		214,977			95,160	98,700	[5] 120,000	
India	26,192,000	23,812,000	23,522,000	20,779,000	4,705,000	4,372,000	3,401,000	3,900,000
China [9]	*4,519,000*	*5,228,000*	*4,800,000*	*5,300,000*	*2,060,000*	*2,250,000*	*1,700,000*	*2,300,000*
Japan	2,857				1,090			
Chosen	495,232	473,000	472,000	393,000	137,593	154,000	136,000	127,000
French Indo-China	35,324	[10] 27,737			5,652	[11] 5,782		
Dutch East Indies	21,708	21,488			4,699			
Siam	8,951				3,244			
Australia	22,895	39,768	70,000		7,311	10,233	9,700	
New Hebrides					2,508			
Estimated world total, including China	85,380,000	86,700,000	82,400,000	77,100,000	26,740,100	25,800,000	27,500,000	24,000,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Data for crop year as given at the head of table are for crops harvested between Aug. 1 and July 31.

1 Preliminary.
2 Bales of 478 pounds net.
3 Linters not included. Production of linters during this period has been: Average 1925–26 to 1929–30 1,162,506 bales; 1930–31, 986,430 bales; 1931–32, 1,067,381 bales.
4 Average for 4 years.
5 From an unofficial source.
6 Average for 3 years.
7 Estimate for 1 year.
8 A small part of the crop is grown in European Russia.
9 Estimates of the Chinese Mill Owners' Association, except figures for 1930–31, 1931–32, and 1932–33 which are estimates of the Bureau of Agricultural Economics. The figures represent the crop in the most important Provinces where the commercial crop is grown.
10 Includes Annam, Cochin-China and Tonkin.
11 Includes Annam and Tonkin.

TABLE 106.—*Cotton: World production of lint, 1909–10 to 1932–33*

Crop year	Estimated world total excluding China	Estimated world total including China	Production in selected countries						Estimated world total commercial crop [2]
			United States	India	Egypt	China [1]	Brazil	Russia	
	1,000 bales [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [4]
1909–10	16,900		10,005	3,998	1,036		324		[5] 16,241
1910–11	18,400		11,609	3,254	1,555		357		[5] 18,027
1911–12	21,900		15,693	2,730	1,530		360		[5] 21,269
1912–13	21,100		13,703	3,702	1,554		418		[5] 20,976
1913–14	22,200		14,156	4,239	1,588		477		[5] 21,618
1914–15	24,200		16,135	4,359	1,337		465	1,270	[5] 23,768
1915–16	17,800		11,192	3,128	989		339	1,512	[5] 17,649
1916–17	18,366	19,900	11,450	3,759	1,048	1,534	337	1,199	[5] 18,092
1917–18	17,608	19,700	11,302	3,393	1,304	2,002	414	634	[3] 18,140
1918–19	17,841	20,900	12,041	3,328	999	3,059	406	161	[3] 18,755
1919–20	18,782	21,300	11,421	4,853	1,155	2,518	461	81	[3] 20,220
1920–21	19,217	21,100	13,440	3,013	1,251	1,883	476	58	[3] 19,665
1921–22	13,886	15,400	7,954	3,753	902	1,514	504	43	[3] 15,334
1922–23	16,982	19,300	9,755	4,247	1,391	2,318	553	55	17,926
1923–24	17,707	19,700	10,140	4,320	1,353	1,993	570	196	19,030
1924–25	22,622	24,800	13,628	5,095	1,507	2,178	605	453	23,8[illegible]6
1925–26	25,798	27,900	16,104	5,201	1,629	2,192	602	782	26,678
1926–27	26,658	28,400	17,977	4,205	1,586	1,742	512	830	27,819
1927–28	22,125	24,000	12,955	4,990	1,261	1,875	487	904	23,420
1928–29	24,434	26,900	14,478	4,838	1,672	2,466	525	1,174	25,628
1929–30	24,384	26,500	14,828	4,289	1,768	2,116	584	1,279	26,653
1930–31	23,550	25,800	13,932	4,372	1,715	2,250	470	1,589	25,304
1931–32	25,800	27,500	17,096	3,401	1,288	1,700	570	1,851	26,329
1932–33 [6]	21,700	24,000	12,994	3,900	950	2,300	348	[7] 1,050	

Bureau of Agricultural Economics. Compiled from official sources and International Institute of Agriculture unless otherwise stated. The crop year is from Aug. 1 to July 31. For the United States prior to 1914 the figures apply to the year beginning Sept. 1.

[1] Chinese Cotton Mill Owners' Association, except for 1930–31 to 1932–33, which are estimates of the Bureau of Agricultural Economics. Figures represent the crop in the most important cotton-producing Provinces where the commercial crop is grown. Most of the cotton produced in other Provinces is used for home hand-loom consumption.

[2] Figures as reported by the U. S. Bureau of the Census, including the cotton destined to enter commercial channels for factory purposes. Estimates of the commercial crop in China are included.

[3] Bales of 478 pound net.

[4] American in running bales and foreign cotton in bales of 478 pounds net.

[5] Bales of 500 pounds net.

[6] Preliminary.

[7] Approximate, mid-point of range of reports.

TABLE 107.—*Cotton: Estimated monthly marketings by farmers, 1922–23 to 1931–32*

Year beginning August	Percentage of sales [1]												
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Season
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1922–23	5.2	16.8	25.3	19.8	12.8	5.9	4.4	3.7	2.0	1.0	1.5	1.6	100
1923–24	4.1	16.3	24.6	24.9	13.3	5.8	3.1	2.4	1.7	1.3	.9	1.6	100
1924–25	3.3	15.2	25.2	22.3	14.5	7.0	5.3	3.4	1.6	1.0	.6	.6	100
1925–26	6.5	19.3	23.1	17.6	12.0	6.5	4.2	3.1	2.3	1.7	2.1	1.6	100
1926–27	2.7	15.2	22.0	19.5	12.5	6.3	5.8	5.0	3.8	3.1	2.5	1.6	100
1927–28	6.6	20.0	23.8	17.3	9.7	4.2	4.0	4.2	3.1	2.7	2.3	2.1	100
1928–29	4.6	15.6	24.8	20.8	12.8	5.4	4.0	4.8	1.8	1.6	1.9	1.9	100
1929–30	5.7	18.2	28.3	20.6	11.8	4.2	2.6	2.3	1.4	1.1	1.6	2.2	100
1930–31	7.7	19.0	25.6	20.3	11.7	3.9	2.8	2.4	1.8	1.6	1.8	1.4	100
1931–32	2.9	13.4	23.9	20.5	13.6	6.3	5.9	5.2	2.6	1.7	1.8	2.2	100

Bureau of Agricultural Economics.

[1] *As reported by about 7,500 cotton growers, supplemented by records of State weighers, cooperative associations, and cotton dealers.*

TABLE 108.—*Cotton: Estimated grade and staple of crop and carry-over, United States, 1928–29 to 1931–32*

	Crop				Carry-over Aug. 1[1]				
	1928–29	1929–30	1930–31	1931–32[6]	1928	1929	1930	1931	1932[6]
	1,000 bales	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
Total[2]	14, 296. 5	14, 547. 8	13, 755. 5	16, 595. 8	2, 425. 6	2, 129. 8	4, 321. 7	6, 262. 7	9, 581. 4
Total American upland	14, 268. 2	14, 519. 0	13, 732. 2	16, 582. 1	2, 419. 8	2, 122. 6	4, 313. 6	6, 246. 0	9, 564. 9
Total American Egyptian	28. 3	28. 8	23. 3	13. 7	5. 8	7. 2	8. 1	16. 7	16. 5
Grades (American upland):									
Extra White—									
Strict Middling and above	288. 4	348. 2	338. 5	250. 9	10. 7	3. 9	54. 4	55. 0	73. 7
Middling and below	118. 3	120. 5	162. 1	184. 4	4. 2	. 9	23. 2	24. 4	30. 5
White—									
Middling Fair	. 7	. 2							
Strict Good Middling	41. 8	38. 7	13. 0	10. 9	1. 7	2. 8	3. 6	3. 2	3. 2
Good Middling	1, 630. 0	863. 9	892. 3	944. 5	173. 8	77. 0	159. 7	219. 9	454. 9
Strict Middling	4, 845. 6	3, 877. 9	4, 364. 0	5, 876. 7	762. 9	430. 0	872. 0	1, 536. 3	3, 185. 5
Middling	3, 250. 4	4, 399. 1	4, 211. 7	5, 230. 7	753. 7	687. 7	1, 279. 0	2, 077. 8	3, 294. 2
Strict Low Middling	1, 387. 2	1, 881. 7	1, 749. 7	1, 758. 1	330. 6	348. 0	583. 0	928. 3	1, 083. 7
Low Middling	447. 7	805. 4	576. 9	630. 3	78. 2	132. 6	286. 8	273. 9	243. 1
Strict Good Ordinary	247. 5	290. 1	114. 6	409. 1	37. 8	89. 6	159. 1	71. 4	148. 6
Good Ordinary	89. 2	80. 1	20. 0	151. 3	15. 9	44. 9	61. 0	21. 3	95. 5
Spotted—									
Good Middling	142. 9	47. 1	147. 2	115. 3	14. 4	9. 1	32. 5	93. 1	102. 4
Strict Middling	792. 7	648. 9	557. 0	429. 8	54. 9	52. 6	160. 6	383. 0	392. 3
Middling	466. 1	564. 3	335. 2	249. 2	51. 9	64. 1	210. 1	348. 2	244. 3
Strict Low Middling	196. 1	234. 4	143. 7	183. 3	24. 8	44. 3	136. 6	96. 3	59. 0
Low Middling	80. 1	72. 6	31. 2	69. 7	14. 6	24. 8	63. 6	27. 1	31. 4
Other[3]	67. 4	189. 4	62. 9	37. 3	61. 0	46. 4	130. 9	66. 8	62. 4
No grade[4]	176. 1	56. 5	12. 2	50. 6	28. 7	63. 9	97. 5	21. 0	57. 2
Staple length (inches):									
Shorter than 7/8	2, 072. 1	2, 921. 5	1, 829. 2	1, 014. 5	87. 8	155. 0	446. 8	463. 2	298. 3
7/8 and 29/32	5, 914. 8	5, 533. 7	5, 327. 7	6, 580. 8	485. 0	650. 9	1, 445. 6	2, 615. 7	3, 394. 9
15/16 and 31/32	3, 225. 7	2, 748. 2	3, 421. 6	4, 515. 0	426. 8	397. 4	825. 4	1, 528. 2	2, 705. 6
1 and 1 1/32	1, 575. 8	1, 693. 6	1, 725. 9	2, 551. 1	659. 8	395. 1	783. 0	849. 2	1, 658. 3
1 1/16 and 1 3/32	794. 2	938. 6	970. 9	1, 077. 0	268. 5	221. 3	389. 3	414. 8	754. 5
1 1/8 and 1 5/32	489. 2	556. 1	393. 3	586. 4	287. 2	170. 1	283. 4	269. 5	546. 7
1 3/16 and longer	196. 4	127. 3	63. 6	257. 3	204. 7	132. 8	140. 1	106. 4	206. 6
Tenderability:[5]									
Total tenderable	11, 664. 7	10, 992. 5	11, 623. 2	14, 832. 2	2, 198. 0	1, 747. 0	3, 416. 3	5, 543. 3	8, 887. 3
Total untenderable	2, 603. 5	3, 526. 5	2, 109. 0	1, 749. 9	221. 8	375. 6	897. 3	702. 7	677. 6

Bureau of Agricultural Economics.

[1] Carry-over of foreign cotton not included. (Table 109.)
[2] Report of Bureau of Census.
[3] Includes *Yellow Tinged, Light Yellow Stained, Yellow Stained, Gray and Blue Stained.*
[4] Includes all bales not otherwise classified above.
[5] According to sec. 5, U. S. cotton futures act.
[6] Preliminary.

TABLE 109.—*Cotton: Consumption by domestic mills, 1919–20 to 1931–32, inclusive*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 bales	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
1919–20	497	491	556	491	512	592	516	576	567	541	555	526	6, 420
1920–21	484	458	401	333	295	367	395	438	409	441	462	410	4, 893
1921–22	*467*	*485*	*494*	*528*	*511*	*527*	*472*	*520*	*444*	*495*	*509*	*458*	*5, 910*
1922–23	526	494	534	579	529	610	567	624	577	621	542	463	6, 666
1923–24	492	486	543	533	464	578	509	486	479	414	350	347	5, 681
1924–25	357	438	534	495	534	594	551	583	597	532	494	484	6, 193
1925–26	*451*	*483*	*544*	*544*	*576*	*582*	*565*	*636*	*578*	*516*	*519*	*462*	*6, 456*
1926–27	600	571	568	584	603	603	590	693	618	630	600	570	7, 190
1927–28	634	628	614	627	539	586	573	581	525	577	510	440	6, 834
1928–29	526	492	616	611	533	668	595	632	632	669	570	547	7, 091
1929–30	*559*	*546*	*640*	*541*	*453*	*576*	*494*	*508*	*532*	*473*	*405*	*379*	*6, 106*
1930–31	353	393	443	415	406	460	433	491	509	465	454	451	5, 263
1931–32	425	464	461	425	415	436	451	489	367	332	323	279	4, 866

Bureau of the Census. Quantities are in running bales, round counted as half bales and foreign in 500-pound bales. Linters not included.

TABLE 110.—*Cotton: Supply and distribution, United States, 1913–14 to 1931–32*

Year beginning August	Supply					Distribution					
	Production [1]	Carry-over from previous season		Imports	Total supply	Consumption		Exports	Stocks on hand at end of year		Total distribution [2]
		Foreign	Total			Foreign	Total		Foreign	Total	
	1,000 bales	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
1913	13, 983	83	1, 511	261	15, 755	194	5, 577	8, 655	73	1, 360	15, 598
1914	15, 906	73	1, 366	382	17, 654	222	5, 597	8, 323	145	3, 936	17, 850
1915	11, 068	145	3, 936	438	15, 442	317	6, 398	5, 896	212	3, 140	15, 434
1916	11, 364	212	3, 140	292	14, 796	318	6, 789	5, 300	143	2, 720	14, 809
1917	11, 248	143	2, 720	221	14, 189	184	6, 566	4, 288	111	3, 450	14, 304
1918	11, 906	111	3, 450	202	15, 558	176	5, 766	5, 592	83	4, 287	15, 645
1919	11, 326	83	4, 287	700	16, 313	417	6, 420	6, 545	284	3, 563	16, 528
1920	13, 271	284	3, 563	226	17, 060	216	4, 893	5, 745	174	6, 534	17, 172
1921	7, 978	174	6, 534	363	14, 875	297	5, 910	6, 184	167	2, 832	14, 926
1922	9, 729	167	2, 832	470	13, 031	344	6, 666	4, 823	196	2, 325	13, 814
1923	10, 171	196	2, 325	292	12, 788	328	5, 681	5, 656	116	1, 556	12, 893
1924	13, 639	116	1, 556	313	15, 508	276	6, 193	8, 005	106	1, 610	15, 808
1925	16, 123	106	1, 610	326	18, 059	280	6, 456	8, 051	129	3, 543	18, 050
1926	17, 755	129	3, 543	401	21, 699	309	7, 190	10, 927	99	3, 762	21, 879
1927	12, 783	99	3, 762	338	16, 883	299	6, 834	7, 540	111	2, 536	16, 910
1928	14, 297	111	2, 536	458	17, 291	313	7, 091	8, 044	182	2, 312	17, 447
1929	14, 548	182	2, 312	378	17, 238	302	6, 106	6, 690	209	4, 530	17, 326
1930	13, 756	209	4, 530	108	18, 394	179	5, 263	6, 760	107	6, 370	18, 393
1931	16, 629	107	6, 370	132	23, 131	122	4, 866	8, 708	97	9, 678	23, 252

Bureau of Agricultural Economics. Compiled from Bureau of Census Reports. Linters are excluded. Quantities are in running bales, round bales counted as half bales and foreign in 500-pound bales.

[1] Production is expressed in running bales in this table and therefore the figures are not the same as those shown in tables where bales of 478 pounds net are used. Consumption and carry-over statistics for American cotton are available only in running bales, and therefore production and exports are shown in running bales.

[2] Total distribution usually is greater than total supply due principally to the inclusion, in all distribution items, of the "city crop," which consists of rebaled samples and pickings from cotton damaged by fire and weather.

TABLE 111.—*Cotton: Mill consumption of American and other growths in the world, United States, and foreign countries, 1913–14 to 1931–32*

Year beginning August [1]	World			United States			Foreign countries		
	All growths	American	Other growths	All growths	American	Other growths	All growths	American	Other growths
	1,000 bales [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]	*1,000 bales* [2]
1913	22, 200	13, 825	8, 375	5, 577	5, 383	194	16, 623	8, 442	8, 181
1914	20, 671	13, 249	7, 422	5, 597	5, 375	222	15, 074	7, 874	7, 200
1915	21, 978	13, 039	8, 939	6, 398	6, 081	317	15, 580	6, 958	8, 622
1916	21, 109	12, 561	8, 548	6, 789	6, 470	319	14, 320	6, 091	8, 229
1917	18, 516	10, 871	7, 645	6, 566	6, 382	184	1, 950	4, 489	7, 461
1918	16, 705	9, 909	6, 796	5, 766	5, 590	176	10, 939	4, 319	6, 620
1919	19, 300	11, 898	7, 402	6, 420	6, 003	417	12, 880	5, 895	6, 985
1920	16, 905	10, 268	6, 637	4, 893	4, 677	216	12, 012	5, 591	6, 421
1921	19, 990	12, 209	7, 781	5, 910	5, 613	297	14, 080	6, 596	7, 484
1922	21, 325	12, 446	8, 879	6, 666	6, 322	344	14, 659	6, 124	8, 535
1923	19, 982	10, 917	9, 065	5, 781	5, 353	328	14, 301	5, 564	8, 737
1924	22, 642	13, 311	9, 331	6, 193	5, 917	276	16, 449	7, 394	9, 055
1925	23, 930	14, 010	9, 920	6, 456	6, 176	280	17, 474	7, 834	9, 640
1926	25, 869	15, 748	10, 121	7, 190	6, 880	310	18, 679	8, 868	9, 811
1927	25, 285	15, 576	9, 709	6, 834	6, 535	299	18, 451	9, 041	9, 410
1928	25, 782	15, 226	10, 556	7, 091	6, 778	313	18, 691	8, 448	10, 243
1929	24, 878	13, 021	11, 857	6, 106	5, 803	303	18, 772	7, 218	11, 554
1930	22, 402	11, 113	11, 289	5, 263	5, 084	179	17, 139	6, 029	11, 110
1931	22, 896	12, 411	10, 485	4, 866	4, 744	122	18, 030	7, 667	10, 363

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census, U. S. Department of Commerce, except consumption figures for American cotton in foreign countries which are from the 1931 Cotton Year Book and weekly trade report, No. 307, Dec. 5, 1932 of the New York Cotton Exchange. The consumption figures for Other Growths in the world and in foreign countries were obtained by deduction.

[1] Year beginning Aug. 1, except 1913, which is the year beginning Sept. 1.

[2] American in running bales and other growths in bales of 478 pounds net. Prior to 1919–20 the quantities given for world consumption of all growths were reported in bales of 500 pounds net and have been converted to equivalent 478 pounds bales.

TABLE 112.—*Cotton: International trade, average 1925–26 to 1929–30, annual 1928–29 to 1931–32*

Country	Year beginning July									
	Average, 1925–26 to 1929–30		1928–29		1929–30		1930–31		1931–32 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
United States	8,579	399	8,520	476	7,096	414	7,048	107	8,989	139
British India	2,938	176	3,250	88	3,270	117	3,152	388	1,565	476
Egypt	1,484	0	1,645	0	1,394	0	1,283	0	1,649	0
Brazil	119	0	53	0	290	0	109	0	40	0
Argentina	88	[2] 1	113	-------	129	-------	107	1	123	0
Total	13,208	576	13,581	564	12,179	531	11,699	496	12,366	615
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	3,070	0	3,168	0	2,648	0	2,172	0	2,475
Japan	0	3,061	0	3,110	0	2,859	0	2,777	0	3,628
Germany	325	1,900	353	1,757	393	1,780	358	1,645	350	1,666
France	100	1,641	108	1,669	50	1,656	43	1,669	47	789
Italy	1	1,053	0	1,121	2	1,103	1	791	0	857
Czechoslovakia	4	567	1	566	1	518	1	450	1	395
Belgium	14	400	21	406	21	451	38	357	73	298
Poland	0	283	0	309	0	225	0	282	0	218
Canada	0	271	0	306	0	218	0	200	0	202
Netherlands	2	192	2	208	1	214	1	215	2	189
Austria	1	149	1	147	1	119	0	99	0	115
Switzerland	0	141	0	139	0	136	0	123	2	109
Sweden	0	106	0	101	0	105	0	96	0	121
Finland	0	39	0	38	0	30	0	36	0	34
Hungary	0	37	0	46	0	60	0	61	0	75
Estonia	0	25	0	24	0	28	0	18	0	16
Denmark	0	21	0	20	0	27	0	28	0	28
Norway	0	9	0	7	0	9	0	10	0	9
Total	447	12,965	486	13,142	469	12,186	442	11,038	475	11,224

Bureau of Agricultural Economics. Official sources. Bales of 500 pounds gross weight or 478 pounds net. The figures for cotton refer to ginned and unginned cotton and linters, but not to mill waste, cotton batting, scarto (Egyptian and Sudan). Wherever unginned cotton has been separately stated in the original reports it has been reduced to ginned cotton in this statement at the ratio of 3 pounds unginned to 1 pound ginned. Wherever linters are stated separately, they have been excluded from these figures.

[1] Preliminary.
[2] 3-year average.

TABLE 113.—*Cotton, Estimated average price per pound received by producers, United States, 1923–24 to 1932–33*

Crop year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	23.8	25.6	28.0	29.9	32.1	32.5	31.4	27.7	28.7	28.1	27.8	27.3	28.7
1924–25	27.8	22.2	23.1	22.5	22.2	22.7	23.0	24.5	23.7	23.0	23.0	23.4	22.9
1925–26	23.4	22.5	21.5	18.1	17.4	17.4	17.6	16.5	16.6	16.0	16.1	15.4	19.6
1926–27	16.1	16.8	11.7	11.0	10.0	10.6	11.5	12.5	12.3	13.9	14.8	15.5	12.5
1927–28	17.1	22.5	21.0	20.0	18.7	18.6	17.0	17.8	18.7	20.1	19.7	21.0	20.2
1928–29	18.8	17.6	18.1	17.8	18.0	17.9	18.0	18.8	18.5	18.0	17.9	17.8	18.0
1929–30	18.0	18.2	17.5	16.2	16.6	15.8	14.8	13.6	14.7	14.5	14.0	11.9	16.8
1930–31	11.4	9.9	9.2	9.6	8.7	8.6	9.1	9.6	9.3	8.8	7.7	8.5	9.5
1931–32	6.3	5.9	5.3	6.1	5.5	5.6	5.8	6.2	5.7	5.2	4.6	5.1	5.7
1932–33	6.5	7.2	6.4	5.9	5.4	-------	-------	-------	-------	-------	-------	-------	-------

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by bales marketed monthly. Mean of prices reported on 1st of month and 1st of succeeding month, August to December, 1923.

TABLE 114.—*Cotton, American Middling, ⅞-inch: Average spot price per pound 10 designated markets, 1915–16 to 1931–32*

Year beginning August	Norfolk	Augusta	Savannah	Montgomery	New Orleans	Memphis	Little Rock	Dallas	Houston	Galveston	Average of 10 markets[1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1915–16	11.62	11.56	11.72	11.37	11.68	11.83	11.84	11.51	12.00	12.06	11.72
1916–17	18.85	19.07	(²)	18.86	18.84	19.08	18.89	18.43	18.92	19.06	[3] 18.96
1917–18	28.82	29.01	29.29	29.15	28.96	29.49	29.06	28.47	28.85	29.06	29.02
1918–19	28.74	29.21	30.02	29.28	29.87	30.11	29.75	29.64	30.26	30.78	29.70
1919–20	37.32	37.93	38.22	37.52	38.21	38.70	38.38	38.95	38.78	39.41	38.34
1920–21	16.92	16.62	17.20	16.37	16.55	17.20	16.69	15.79	16.33	16.89	16.66
1921–22	18.00	17.97	18.12	17.48	17.92	18.38	18.12	17.84	18.46	18.64	18.09
1922–23	25.87	25.92	25.87	25.49	25.94	26.21	25.78	25.31	25.94	26.03	25.83
1923–24	30.15	30.06	30.00	29.82	30.33	30.42	30.22	29.66	30.28	30.48	30.14
1924–25	24.38	24.24	24.27	23.71	24.21	24.19	24.27	23.91	24.50	24.57	24.22
1925–26	19.78	19.53	19.61	18.98	19.71	19.77	19.70	19.64	20.00	20.12	19.68
1926–27	14.56	14.37	14.46	13.65	14.74	14.31	14.29	13.91	14.73	14.79	14.40
1927–28	20.17	20.09	20.06	19.46	19.98	19.44	19.31	19.04	19.76	19.84	19.72
1928–29	19.07	18.95	18.92	18.42	18.98	18.31	18.29	18.19	18.74	18.82	18.67
1929–30	16.34	15.97	15.98	15.41	16.16	15.43	15.33	15.32	15.89	16.00	15.79
1930–31	10.11	9.73	9.81	9.28	10.08	9.22	9.10	9.19	9.74	9.82	9.61
1931–32	6.23	6.08	6.09	5.69	6.20	5.59	5.48	5.57	5.93	6.03	5.89

Bureau of Agricultural Economics. Compiled from the daily reports to the Bureau of Agricultural Economics from the cotton exchanges of the various markets.

[1] Averages of monthly averages of 10 markets.
[2] Comparable data not available for February.
[3] Excludes Savannah for February.

TABLE 115.—*Cotton, Middling: Average spot price per pound at New Orleans and 10 markets combined, 1919–20 to 1932–33*

Market and crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
New Orleans:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1919–20	31.38	30.38	35.28	39.58	39.89	40.28	39.39	40.69	41.41	40.31	40.49	39.41	38.21
1920–21	34.03	27.48	20.95	17.65	14.59	14.53	12.85	11.08	11.17	11.80	11.03	11.49	16.55
1921–22	12.78	19.35	18.99	17.27	17.16	16.53	16.36	16.74	16.80	19.31	21.68	22.01	17.92
1922–23	21.55	20.74	22.05	25.34	25.48	27.51	28.78	30.43	28.42	26.63	28.61	25.73	25.94
1923–24	24.22	27.71	29.18	33.68	34.88	33.93	31.90	28.74	30.41	30.70	29.43	29.23	30.33
1924–25	26.65	22.79	23.48	23.95	23.66	23.66	24.61	25.52	24.52	23.54	24.07	24.05	24.21
1925–26	23.07	23.09	20.86	19.82	19.27	20.26	19.83	18.35	18.11	18.06	17.54	18.24	19.71
1926–27	18.01	16.14	12.68	12.52	12.22	13.17	13.82	14.10	14.42	15.68	16.47	17.63	14.74
1927–28	19.36	21.53	20.73	19.99	19.26	18.72	17.90	18.94	20.07	20.77	21.10	21.45	19.98
1928–29	19.00	17.94	18.79	19.00	19.36	19.14	19.07	19.97	19.23	18.74	18.81	18.73	18.98
1929–30	18.57	18.45	18.08	17.19	17.04	16.84	15.25	14.87	15.79	15.60	13.56	12.65	16.16
1930–31	11.56	10.58	10.40	10.63	9.65	9.87	10.63	10.59	9.95	9.08	8.86	9.10	10.08
1931–32	7.02	6.20	6.06	6.32	6.10	6.50	6.69	6.74	6.12	5.70	5.18	5.73	6.20
1932–33	7.29	7.58	6.51	6.12	5.84								
10 markets combined:													
1919–20	31.50	30.30	35.44	39.59	39.70	40.46	39.49	40.68	41.74	41.01	40.58	39.58	38.34
1920–21	34.78	28.24	21.38	17.83	14.63	14.42	12.93	11.19	11.01	11.55	10.77	11.13	16.66
1921–22	12.53	19.50	19.25	17.43	17.47	17.04	16.73	17.12	16.92	19.22	21.58	22.27	18.09
1922–23	21.53	20.72	22.11	25.20	25.40	27.39	28.62	30.21	28.28	26.47	28.20	25.87	25.83
1923–24	24.22	27.67	28.90	33.30	34.39	33.69	31.73	28.54	30.25	30.32	29.37	29.32	30.14
1924–25	27.16	22.74	23.29	23.63	23.40	23.53	24.51	25.51	24.56	23.61	24.19	24.55	24.22
1925–26	23.35	23.23	20.95	19.92	19.31	20.04	19.63	18.33	18.05	17.95	17.52	17.92	19.68
1926–27	17.65	15.96	12.40	12.17	11.81	12.72	13.45	13.74	14.08	15.38	16.10	17.34	14.40
1927–28	19.16	21.19	20.35	19.74	18.99	18.44	17.60	18.76	19.76	20.54	20.82	21.25	19.72
1928–29	18.72	17.72	18.46	18.70	19.07	18.88	18.86	19.78	18.95	18.23	18.36	18.29	18.67
1929–30	18.04	18.01	17.62	16.75	16.64	16.56	15.11	14.74	15.40	15.12	13.21	12.21	15.79
1930–31	11.14	10.15	9.82	10.09	9.16	9.37	10.12	10.15	9.50	8.70	8.42	8.66	9.61
1931–32	6.57	5.83	5.75	5.95	5.78	6.15	6.40	6.44	5.83	5.41	4.99	5.54	5.89
1932–33	7.08	7.40	6.37	6.03	5.72								

Bureau of Agricultural Economics. Compiled from daily reports to the bureau from the cotton exchanges of the various markets. Data for earlier years appear in previous issues of the Yearbook.

TABLE 116.—*Cotton: Average staple premiums and discounts based on 7/8-inch for Middling spot cotton, 1923–24 to 1931–32*

Crop year	Discount for 13/16 inch [1]	7/8-inch average price per pound [2]	Premiums for— [3]					
			15/16 inch	1 inch	1 1/16 inches	1 1/8 inches	1 3/16 inches	1 1/4 inches
	Points [4]	*Cents*	*Points*	*Points*	*Points*	*Points*	*Points*	*Points*
1923–24	----------	30.14	40	68	80	149	250	369
1924–25	85	24.22	58	81	175	396	621	897
1925–26	125	19.68	76	106	202	395	634	935
1926–27	100	14.40	63	105	157	302	479	751
1927–28	94	19.72	42	88	166	275	409	631
1928–29	67	18.67	31	98	176	236	331	586
1929–30	108	15.79	48	113	181	231	346	029
1930–31	95	9.61	41	87	154	191	316	670
1931–32	36	5.89	19	46	93	154	244	[5] 425

Bureau of Agricultural Economics.

[1] Average of New Orleans, Houston, and Galveston, calculated from actual sales and partly estimated.
[2] Average for the 10 designated spot markets.
[3] Average of New Orleans and Memphis for 1 1/16 inches and longer and for fifteenth-sixteenths inch and 1 inch from 1923-24 to 1926-27, inclusive. Average of six designated markets (New Orleans, Memphis, Houston, Galveston, Dallas, and Little Rock) for fifteenth-sixteenths inch and 1 inch from 1927-28 to 1931-32, inclusive.
[4] Hundredths of a cent a pound.
[5] Memphis only.

TABLE 117.—*Cotton: Average spot price per pound at Liverpool, by kind and by months, 1923–24 to 1932–33*

Description and crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
American Middling: [1]	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	28.56	32.69	32.27	36.41	36.95	35.23	33.40	30.57	33.74	32.92	31.66	31.47	32.99
1924–25	31.63	26.49	26.14	26.08	25.73	26.08	27.14	28.04	26.85	25.83	27.34	27.76	27.09
1925–26	26.29	26.25	23.16	21.40	20.46	21.68	21.41	20.32	20.38	20.72	19.97	19.77	21.82
1926–27	19.69	19.34	14.52	14.07	13.46	14.56	15.55	15.65	16.14	17.90	18.49	19.43	16.57
1927–28	21.09	24.17	23.36	22.73	21.98	21.68	20.54	21.80	22.75	23.52	23.70	24.43	22.65
1928–29	21.39	20.87	21.86	21.62	21.57	21.39	21.09	22.32	21.57	20.62	20.89	21.09	21.36
1929–30	21.01	20.93	20.52	19.61	19.22	19.00	17.36	16.83	17.72	17.46	16.16	15.47	18.44
1930–31	14.09	12.63	11.88	12.13	10.99	11.19	12.06	12.09	11.42	10.56	10.00	10.26	11.61
1931–32	7.91	7.70	7.65	7.70	7.38	7.78	8.25	8.31	7.59	6.92	6.43	6.92	7.54
1932–33	8.11	8.87	7.91	7.52	7.09	------	------	------	------	------	------	------	------
Indian Oomra, No. 1, Fine:													
1923–24	20.56	22.79	22.96	26.84	28.56	26.94	25.42	23.35	24.82	23.78	23.54	22.87	24.37
1924–25	20.29	22.38	22.77	28.23	30.76	30.24	28.16	25.99	27.35	26.48	26.40	25.43	26.21
1925–26	22.30	22.89	20.80	18.98	17.62	18.17	17.56	16.20	15.96	16.38	15.59	15.70	18.18
1926–27	16.06	15.98	13.08	12.69	12.17	12.68	13.79	13.87	14.32	15.92	16.65	17.46	14.58
1927–28	18.29	20.70	19.79	18.70	18.13	17.88	16.99	17.97	18.37	18.88	19.08	19.14	18.66
1928–29	16.57	15.65	16.26	16.53	16.99	16.75	16.42	17.50	16.14	15.33	15.69	15.73	16.30
1929–30	15.73	15.71	15.37	14.50	14.32	13.87	12.09	11.36	11.66	11.36	10.18	9.21	12.95
1930–31	8.23	8.15	8.17	8.68	8.74	7.91	8.84	8.84	8.33	7.73	7.62	8.05	8.27
1931–32	6.45	6.19	6.50	6.91	6.75	7.55	7.81	7.61	6.92	6.28	5.77	6.32	6.76
1932–33	7.27	7.87	6.95	6.73	6.32	------	------	------	------	------	------	------	------
Egyptian Sakellaridis, Fully Good Fair:													
1923–24	30.99	34.16	34.72	41.39	43.07	41.24	39.69	37.40	40.63	42.86	42.75	43.34	39.35
1924–25	48.28	46.30	47.23	49.63	55.60	60.71	69.40	73.39	63.32	62.00	64.36	65.04	58.77
1925–26	61.13	56.96	50.91	41.51	35.76	37.19	36.62	32.32	32.38	34.07	33.94	32.85	40.47
1926–27	32.04	36.32	31.21	30.23	27.82	27.96	27.82	27.46	28.06	33.15	34.41	37.92	31.20
1927–28	39.13	40.57	38.51	37.80	35.48	35.61	35.38	39.90	42.97	43.49	43.03	40.64	39.38
1928–29	37.61	36.54	36.74	37.35	39.11	38.83	36.52	38.69	37.55	35.79	33.44	33.78	36.83
1929–30	34.07	34.90	32.16	30.27	28.87	29.26	27.62	28.02	28.79	28.37	25.79	25.10	29.44
1930–31	23.22	20.89	19.61	19.51	16.22	17.01	19.47	19.59	17.74	16.59	15.63	15.57	18.42
1931–32	12.15	11.82	11.60	11.50	10.05	10.38	10.93	11.25	10.30	9.33	8.93	10.04	10.69
1932–33	11.47	12.60	11.31	10.58	9.64	------	------	------	------	------	------	------	------
Egyptian Uppers, Fully Good Fair:													
1923–24	81.16	33.04	32.63	39.28	41.04	39.11	38.41	36.65	39.72	42.68	42.12	42.45	38.19
1924–25	44.38	36.63	33.35	34.28	36.31	39.11	39.35	41.87	40.44	38.39	37.43	38.07	38.30
1925–26	37.01	36.11	34.36	31.68	29.44	28.92	27.46	25.18	24.88	25.24	25.18	24.25	29.14
1926–27	24.78	27.09	22.55	21.25	19.06	20.76	21.41	21.82	22.10	25.63	27.19	28.98	23.55
1927–28	30.52	31.90	30.60	30.09	28.45	28.06	26.44	28.77	30.98	31.33	30.15	29.20	29.71
1928–29	25.91	24.11	25.18	24.84	24.84	24.94	24.43	26.12	25.08	23.38	22.97	23.03	24.57
1929–30	22.89	23.54	22.45	21.60	21.23	21.29	20.66	20.52	21.13	20.80	19.45	19.47	21.25
1930–31	17.92	17.09	14.28	13.71	12.49	12.98	14.46	14.42	13.38	12.55	11.92	12.25	13.95
1931–32	9.51	9.55	8.93	8.97	8.20	8.81	9.53	9.83	9.00	8.21	7.90	8.74	8.93
1932–33	10.08	10.95	10.05	9.76	9.18	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from market reports of the Liverpool Cotton Association. Average of Friday's prices, except when Friday was a holiday, the prices on the preceding business day were used. Converted from pence to cents at the current rate of exchange. This series of prices has been revised and does not agree with the series published in earlier issues of the Yearbook.

[1] Prior to August, 1924, these prices are for Liverpool Fully Middling which grade was the most nearly comparable to American Middling as quoted in the United States. Since that time the Liverpool Cotton Association has been quoting prices of American cotton on the basis of the Universal Standards.

TABLE 118.—*Cotton: Average premiums and discounts for grades [1] above and below Middling for the 10 designated spot markets, 1920–21 to 1931–32*

Crop year	Premiums for—				Middling (average price)[2]	Discounts for—			
	Middling Fair	Strict Good Middling	Good Middling	Strict Middling		Strict Low Middling	Low Middling	Strict Good Ordinary [3]	Good Ordinary [3]
	Points [4]	*Points*	*Points*	*Points*	*Cents per pound*	*Points*	*Points*	*Points*	*Points*
1920–21	303	248	185	97	16.06	191	429	622	780
1921–22	201	155	101	65	18.09	75	177	283	384
1922–23	115	88	60	35	25.83	38	85	146	211
1923–24	166	135	105	65	30.14	07	212	333	440
1924–25	108	84	60	87	24.22	74	171	289	406
1925–26	124	98	73	50	19.68	110	268	432	563
1926–27	129	106	82	58	14.40	104	238	379	501
1927–28	100	76	50	33	19.72	51	114	198	284
1928–29	81	60	42	28	18.67	73	153	236	322
1929–30	92	76	61	41	15.79	74	170	278	376
1930–31	88	70	52	31	9.61	59	138	226	304
1931–32	70	56	41	24	5.89	29	64	101	138

Bureau of Agricultural Economics.

[1] White standards.
[2] Based on ⅞-inch staple.
[3] These grades are not deliverable on futures contracts.
[4] Hundredths of a cent a pound.

TABLE 119.—*Cottonseed: Estimated production and weighted average price, by States, 1925–1932*

State	Production, year beginning Aug. 1 [1]—								Weighted average price per ton, crop marketing season—			
	1925	1926	1927	1928	1929	1930	1931	1932 [2]	1929	1930	1931	1932
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Missouri	132	97	51	65	98	67	128	127	31.48	20.57	9.44	9.60
Virginia	23	23	14	19	21	19	19	12	30.06	22.21	10.28	10.70
North Carolina	488	539	382	371	331	343	335	284	28.71	21.93	10.60	11.60
South Carolina	394	448	324	322	368	444	446	308	27.55	21.39	10.63	11.10
Georgia	516	664	488	457	596	707	618	375	27.78	21.77	10.92	11.70
Florida	17	14	8	9	13	22	19	7	28.20	22.11	10.98	12.20
Tennessee	229	200	159	190	229	167	264	200	30.53	20.90	8.75	10.10
Alabama	602	665	529	492	596	655	631	413	30.30	21.22	10.16	11.20
Mississippi	884	838	602	655	851	650	783	511	32.57	22.36	9.78	12.00
Arkansas	711	687	444	554	638	388	848	560	30.36	21.20	8.10	9.80
Louisiana	404	368	243	307	359	317	400	271	29.99	20.84	8.11	9.70
Oklahoma	751	787	461	536	508	379	561	480	30.89	22.97	8.70	8.30
Texas	1,849	2,499	1,938	2,274	1,755	1,799	2,370	1,981	31.70	22.69	9.45	9.00
New Mexico	30	33	31	39	40	44	45	34	26.79	19.96	9.12	8.70
Arizona	53	54	41	66	68	69	51	36	25.56	18.69	9.74	8.90
California	54	56	40	76	115	117	79	56	26.88	21.75	12.80	10.50
All other	12	8	4	3	4	3	5	4	30.50	20.97	9.26	10.00
United States	7,150	7,982	5,759	6,435	6,590	6,190	7,602	5,659	30.43	21.93	9.52	9.98

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Computed from lint production, assuming 65 pounds of cottonseed for each 35 net pounds of lint.
[2] Preliminary.

TABLE 120.—*Cottonseed and cottonseed products: Production in the United States, 1909–10 to 1931–32*

Year beginning August	Cottonseed		Cottonseed products			Year beginning August	Cottonseed		Cottonseed products		
	Produced	Crushed	Crude oil	Cake and meal	Hulls		Produced	Crushed	Crude oil	Cake and meal	Hulls
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*		*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
1909–10	4,462	3,269	491	1,326	1,289	1921–22	3,531	3,008	465	1,355	937
1910–11	5,175	4,106	030	1,792	1,375	1922–23	4,336	3,242	501	1,487	944
1911–12	6,997	4,921	758	2,151	1,642	1923–24	4,502	3,308	490	1,518	941
1912–13	6,104	4,580	697	1,999	1,540	1924–25	6,051	4,605	702	2,126	1,331
1913–14	6,305	4,848	725	2,220	1,400	1925–26	7,150	5,558	809	2,507	1,547
1914–15	7,186	5,780	860	2,648	1,677	1926–27	7,982	6,306	944	2,840	1,854
1915–16	4,992	4,202	627	1,923	1,220	1927–28	5,759	4,654	738	2,093	1,320
1916–17	5,113	4,479	704	2,225	969	1928–29	6,435	5,061	802	2,282	1,368
1917–18	5,040	4,252	656	2,068	996	1929–30	6,590	5,016	786	2,232	1,384
1918–19	5,360	4,479	663	2,170	1,137	1930–31	6,190	4,715	721	2,165	1,304
1919–20	5,074	4,013	606	1,817	1,143	1931–32	7,602	5,328	847	2,402	1,511
1920–21	5,971	4,069	655	1,786	1,256						

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

TABLE 121.—*Cottonseed oil: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	49,815	0	51,702	0	26,075	0	28,297	0	22,578	0
United Kingdom	46,146	18,657	35,798	16,742	53,715	23,090	38,835	35,564	33,378	13,803
Egypt	22,724	80	17,579	3	26,181	1	24,717	-------	17,637	-------
Peru	9,526	0	11,077	0	3,047	0	6,947	0	1,923	0
Brazil	352	23	21	0	1	4	2,314	2	0	2
Algeria	38	29	2	0	46	5	[2] 43	[2] 48	-------	-------
Total	128,601	18,789	116,179	16,745	109,065	23,100	101,153	35,614	75,516	13,805
PRINCIPAL IMPORTING COUNTRIES										
Canada	0	39,439	0	44,324	0	38,675	0	26,071	0	17,207
Germany	283	19,296	20	12,984	912	13,649	1,472	12,293	277	9,216
Netherlands	6,481	16,831	7,264	8,685	3,815	7,474	119	810	51	4,323
France	34	7,792	2	7,142	48	8,122	57	8,103	7	7,379
Denmark	809	6,624	1,224	6,493	1,369	7,378	786	4,686	484	5,919
Norway	0	4,474	0	2,798	0	2,648	0	1,363	0	582
Cuba	0	4,099	0	1,857	0	419	0	1,824	-------	-------
Sweden	447	2,824	48	2,721	473	3,071	0	3,082	0	2,370
Belgium	15	2,347	51	2,026	11	1,117	102	660	2	543
Australia [2]	1	1,914	0	2,967	0	2,651	103	1,465	-------	-------
Greece	0	1,478	0	1,201	0	494	0	36	0	1
Argentina	53	1,470	17	946	27	1,340	6	147	4	50
Gambia [2]	9	622	4	979	39	453	-------	-------	-------	-------
Yugoslavia	0	498	0	368	0	181	0	47	0	69
Uruguay	0	298	0	331	0	65	0	15	-------	-------
Czechoslovakia	0	267	0	281	0	328	0	217	2	485
Italy	2	216	0	327	5	358	1	290	0	287
Total	8,075	110,489	8,630	96,430	6,699	88,423	2,646	61,109	827	48,431

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.

TABLE 122.—*Cottonseed: Estimated average price per ton received by producers, United States, 1922–23 to 1932–33*

Crop year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	37.47	40.88	40.90	45.92	45.54	44.37	43.27	41.34	40.42	40.53	39.96	39.07	42.23
1924–25	38.44	31.74	31.95	33.57	35.48	37.50	37.14	38.21	37.94	38.61	36.66	36.41	34.08
1925–26	36.52	33.48	32.82	27.64	27.87	28.40	29.06	29.47	31.51	30.84	31.89	31.31	30.82
1926–27	29.73	27.38	20.06	18.66	18.05	18.55	22.39	25.43	25.80	26.05	26.27	26.59	21.55
1927–28	25.95	34.41	36.60	37.51	37.14	37.40	37.44	37.77	39.40	43.00	41.25	39.27	35.94
1928–29	36.87	31.02	34.08	37.17	37.74	38.05	38.73	39.36	38.94	37.78	35.83	34.84	35.20
1929–30	32.69	31.03	31.40	30.75	30.31	28.95	28.89	28.63	29.74	30.61	29.66	27.35	30.43
1930–31	23.99	23.89	20.73	21.26	21.28	21.25	21.87	22.43	22.85	22.32	20.32	19.52	21.93
1931–32	14.71	8.93	7.66	11.61	11.01	10.38	10.12	10.17	9.78	9.66	8.85	8.61	9.51
1932–33	9.13	11.28	10.45	9.54	8.87								

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly receipts at oil mills.

TABLE 123.—*Cottonseed oil, crude: Average price per pound in tanks, f. o. b. southeast mills, by months, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24		9.94	9.44	9.88	9.45	9.46	8.84	8.46	8.74	8.20	8.78	10.06
1924–25	11.30	8.34	9.03	8.85	9.69	9.48	9.20	9.95	10.00	9.34	9.75	
1925–26		9.14	8.55	8.90	8.98	9.75	10.71	11.00	11.22	12.17		
1926–27	10.88	8.19	7.44	6.64	6.36	6.94	8.20	7.73	7.33	7.74	8.04	
1927–28	8.70	9.25	9.45	9.05	8.72	8.48	7.75	8.44	8.75	8.88		
1928–29		8.16	8.14	8.24	8.38	8.63	9.12	9.00	8.37	7.94		
1929–30		7.66	7.33	7.38	7.26	7.24	7.40	7.13	7.48	7.32	6.95	7.00
1930–31	6.76	6.48	6.14	6.35	6.12	6.18	6.37	6.75	6.72	6.38	6.27	
1931–32		3.60	3.54	3.80	[1] 3.33	3.24	3.22	3.12	2.61	2.56	2.86	3.24
1932–33	3.71	3.71	(2)	(2)	(2)							

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter; prices, 1923-24 to 1927–28 are averages of weekly quotations; beginning 1928–29, averages of daily quotations.

Data for 1909–10 to 1922–23 are available in the 1930 Yearbook, p. 695, Table 149.

[1] Less than 10 quotations during the month. Other quotations were bids.

[2] No quotations.

TABLE 124.—*Cottonseed oil, prime summer yellow: Average spot price per pound, New York, 1923–24 to 1932–33* [1]

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	10.34	11.62	12.01	11.67	11.00	11.00	10.03	9.77	10.09	9.82	10.42	11.98	10.81
1924–25	13.83	10.54	11.00	10.86	11.41	11.10	10.69	11.10	11.08	10.61	10.75	11.38	11.19
1925–26	11.09	10.81	9.86	10.32	10.47	11.33	11.28	12.24	12.38	14.48	15.38	14.99	12.05
1926–27	12.99	11.42	8.82	8.20	8.22	8.50	9.31	9.39	8.78	9.09	9.19	9.57	9.46
1927–28	9.89	10.74	10.83	10.56	10.06	10.02	9.27	9.64	10.04	10.52	10.22	10.03	10.15
1928–29	9.44	10.03	9.84	9.69	10.21	20.33	10.88	10.74	10.11	9.75	9.64	9.62	10.02
1929–30	9.27	9.19	9.23	9.01	8.77	8.46	8.46	8.41	8.80	8.76	8.23	7.99	8.72
1930–31	8.34	8.20	7.60	7.67	7.28	7.20	7.29	7.58	7.55	6.99	6.76	7.00	7.45
1931–32	5.77	4.39	4.48	4.55	4.09	4.08	3.95	3.96	3.46	3.18	3.34	3.83	4.09
1932–33	4.51	4.48	3.97	3.75	3.48								

Bureau of Agricultural Economics. Compiled from Oil, Paint, and Drug Reporter, average of daily ranges. Data for 1890–91 to 1922–23 are available in 1924 Yearbook, p. 766, Table 323.

[1] *Prices through July, 1930, quoted in barrels; beginning August, 1930, quoted in tanks.*

TABLE 125.—*Cottonseed meal, 41 per cent protein: Price per ton, Memphis, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	43.20	42.90	44.90	47.40	45.00	43.60	41.00	39.60	39.50	39.50	40.25	43.60	42.50
1924–25	43.60	41.40	40.75	38.75	39.25	37.70	35.75	35.90	36.80	38.40	38.80	41.50	39.00
1925–26	44.10	36.90	34.40	34.10	34.00	32.60	31.10	31.00	31.90	30.70	31.00	31.10	33.60
1926–27	32.10	28.90	23.90	23.70	24.50	30.10	33.50	32.40	32.50	34.00	37.40	36.00	30.75
1927–28	(1)	37.40	37.70	39.60	41.40	40.40	45.10	49.30	55.50	61.50	(1)	41.50	------
1928–29	(1)	38.40	43.90	44.20	45.60	44.90	44.40	42.70	38.75	35.50	34.25	38.75	------
1929–30	(1)	41.00	39.30	37.80	37.00	35.40	33.50	33.60	36.75	38.00	35.50	33.60	------
1930–31	36.25	30.90	27.50	27.50	25.60	25.75	24.90	26.40	26.25	24.60	22.40	21.20	26.60
1931–32	17.30	13.80	13.20	16.60	14.45	13.80	12.78	12.44	12.85	12.65	11.50	13.15	13.71
1932–33	17.35	16.75	14.40	13.35	11.80	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

[1] Not reported.

TABLE 126.—*Cottonseed meal, 41 per cent protein, bagged: Average price per ton at 10 markets, by months, 1932*

Market	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*
Boston	23.25	22.51	21.97	22.15	22.10	21.05	22.50	26.30	26.15	23.70	22.85	21.70
Philadelphia	22.60	21.81	21.56	21.70	21.70	20.75	21.80	25.90	25.50	23.30	22.45	20.50
Buffalo	20.25	19.63	19.25	19.10	19.15	18.05	19.75	23.20	23.15	21.25	20.00	18.25
Pittsburgh	20.10	19.44	18.69	19.10	18.85	17.80	19.55	23.10	22.65	19.95	19.35	18.15
Cincinnati	18.75	17.88	17.69	17.80	17.75	16.75	17.70	22.15	21.90	19.55	18.50	17.15
Chicago	18.55	17.56	17.31	17.60	17.55	16.50	17.55	21.65	21.45	18.95	18.10	17.20
Minneapolis	20.90	20.56	20.25	19.95	19.65	------	------	------	------	------	------	------
Los Angeles	25.75	23.88	23.10	21.30	22.30	21.00	22.75	23.80	24.65	23.05	20.30	20.15
St. Louis	17.15	16.44	16.13	16.00	15.80	15.05	15.25	19.40	20.00	17.90	16.50	15.50
San Francisco	28.20	25.75	24.10	24.15	24.20	23.15	23.00	23.80	24.00	22.90	21.65	20.90

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

TABLE 127.—*Sugar beets: Acreage, production, and value, United States,[1] 1911–1932*

Year	Acreage harvested	Yield per acre	Production	Average price per ton received by producers, for crop-marketing season	Farm value, basis average price for crop-marketing season	Year	Acreage harvested	Yield per acre	Production	Average price per ton received by producers, for crop-marketing season	Farm value, basis average price for crop-marketing season
	1,000 acres	*Short tons*	*1,000 short tons*	*Dollars*	*1,000 dollars*		*1,000 acres*	*Short tons*	*1,000 short tons*	*Dollars*	*1,000 dollars*
1911	474	10.7	5,062	5.50	27,841	1922	530	9.8	5,183	7.91	41,017
1912	555	10.2	5,648	5.82	32,871	1923	657	10.7	7,006	8.99	62,965
1913	580	10.1	5,886	5.69	33,491	1924	815	9.2	7,489	7.99	59,838
1914	483	11.6	5,585	5.45	30,438	1925	647	11.4	7,381	6.39	47,147
1915	611	10.7	6,511	5.67	36,950	1926	677	10.7	7,223	7.61	54,964
1916	665	9.4	6,228	6.12	38,139	1927	721	10.8	7,753	7.67	59,455
1917	665	9.0	5,980	7.39	44,192	1928	644	11.0	7,101	7.11	50,477
1918	594	10.0	5,949	10.00	59,494	1929	688	10.6	7,315	7.08	51,805
1919	692	9.3	6,421	11.74	75,420	1930	775	11.9	9,199	7.14	65,697
1920	872	9.8	8,538	11.63	99,324	1931	713	11.1	7,903	5.94	46,948
1921	815	9.6	7,782	6.35	49,392	1932 [2]	768	11.7	8,991	5.10	45,855

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] *Most years from 1911 to 1923 include a small unknown quantity of beets grown in Canada for Michigan factories.*

[2] Preliminary.

TABLE 128.—*Sugar beets: Acreage, yield, production, and average price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Average price per ton, crop-marketing season	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Short tons*	*Short tons*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*
Ohio	41		26	8.8		9.7	347		252		
Michigan	101	58	121	8.1	10.0	9.8	773	581	1,184	6.33	
Wisconsin	14			8.9			127				
Nebraska	74	65	66	11.8	13.7	13.4	933	891	882	5.46	
Montana	31	54	56	[2] 10.5	11.4	13.7	321	617	765	6.01	
Idaho	30	33	53	9.8	9.1	13.1	303	301	692	6.03	
Wyoming	34	49	40	[2] 11.2	11.3	12.8	383	552	512	5.71	
Colorado	192	224	159	11.8	11.3	11.3	2,446	2,532	1,790	5.44	
Utah	*61*	*49*	*57*	*11.2*	*10.3*	*14.4*	*671*	*505*	*823*	*5.82*	
California	63	89	104	8.7	11.9	12.3	551	1,060	1,280	7.40	
Other [3]	60	92	86	[4] 8.7	9.4	9.4	533	864	812	5.97	
United States	701	713	768	10.2	11.1	11.7	7,389	7,903	8,991	5.94	5.10

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.
[2] 5-year average.
[3] States producing sugar beets for which figures are not shown above.
[4] 7-year average.

TABLE 129.—*Sugar beets: Acreage, yield per acre, production, and yield of sugar per short ton of beets sliced, in specified countries, average 1921–1925, annual 1931 and 1932*

Country	Acreage			Yield per acre			Production			Yield of raw sugar per short ton of beets sliced		
	Average, 1921–1925	1931	1932 [1]	Average, 1921–1925	1931	1932 [1]	Average, 1921–1925	1931	1932 [1]	Average, 1921–1925	1931	1932 [2]
	1,000 acres	*1,000 acres*	*1,000 acres*	*Short tons*	*Short tons*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Lbs.*	*Lbs.*	*Lbs.*
Canada	30	50	45	9.8	9.1	10.0	293	454	450	277	279	
United States	693	713	768	10.1	11.1	11.7	6,965	7,903	8,991	298	325	
United Kingdom	*23*	*234*	*256*	*8.3*	*8.0*	*8.8*	*190*	*1,861*	*2,246*	*260*	[3] *335*	
Sweden	94	87	99	12.3	11.1	14.8	1,160	966	1,468	312	[2] 337	308
Denmark	83	70	93	11.6	12.3	14.7	966	863	1,367		[2] 331	293
Netherlands	167	93	99	14.4	12.2	17.5	2,402	1,134	1,731			
Belgium	170	128	132	12.8	12.6	12.5	2,173	1,615	1,650		[2] 309	269
France	413	621	618	10.8	11.0	12.5	4,472	6,829	7,743	266		
Spain	184	277	202	8.8	11.4	9.8	1,610	3,148	1,977	248		
Italy	207	283	207	12.8	9.6	13.3	2,646	2,726	2,750	220	305	274
Germany	982	941	670	10.8	12.9	12.3	10,595	12,168	8,231	321	339	319
Austria	35	106	106	9.0	10.2	10.0	316	1,078	1,061	323	335	330
Czechoslovakia	629	458	361	11.5	12.6	11.2	7,228	5,777	4,055	348	[2] 368	350
Hungary	*133*	*134*	*113*	*8.2*	*7.9*	*8.6*	*1,085*	*1,065*	*968*	*271*	*306*	*280*
Yugoslavia	71	91	91	7.6	7.4		540	671			284	277
Rumania	99	50	45	7.1	6.8		702	341			291	311
Poland	326	367	286	9.0	8.3	9.1	2,926	3,044	2,612	317	360	351
Russia	676	3,401	3,123	5.4	4.5		3,647	15,432		[4] 282		
Other [5]	41	85	124	7.3	7.2		300	609				
Total, countries reporting acreage and production, all years	4,169	4,562	4,055	10.8	11.1	11.7	45,027	50,631	47,300			
Total, all countries reporting	5,056	8,189	7,438	9.9	8.3		50,216	67,684				

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture.

[1] Preliminary.
[2] Compiled from preliminary estimates reported by the International Association for Sugar Statistics.
[3] England and Wales only.
[4] One year only 1925–26.
[5] Includes Switzerland, Bulgaria, Finland, and Australia in the 5-year average. Later years include also Irish Free State, Latvia, Lithuania, and Turkey, in which countries no sugar was produced prior to 1926–27.

TABLE 130.—*Beet sugar: Production, United States, 1911–1932*

Year [1]	Factories operating	Acreage from which beets were harvested [2]	Beets paid for by factories	Beets sliced	Sugar produced (chiefly refined) [3]	Analysis of beets: Purity coefficient [4]	Analysis of beets: Percentage of sucrose [5]	Recovery of sucrose from beets [6]: Paid for	Recovery of sucrose from beets [6]: Sliced	Sugar produced per ton of beets: Paid for	Sugar produced per ton of beets: Sliced	Beet pulp produced: Molasses pulp	Beet pulp produced: Dry pulp other than molasses pulp
	Number	*1,000 acres*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Lbs.*	*Lbs.*	*1,000 short tons*	*1,000 short tons*
1911	66	474		5,062	600	82.21	15.89		11.84		237		
1912	73	555		5,224	693	84.49	16.31		13.26		265		
1913	71	580	5,886	5,659	733	83.22	15.78	12.45	12.96	249	259		
1914	60	483	5,585	5,288	722	83.89	16.38	12.93	13.65	259	273		
1915	67	611	6,511	6,150	874	84.38	16.49	13.42	14.21	268	284		
1916	74	665	6,228	5,920	821	84.74	16.30	13.18	13.86	264	277		
1917	91	665	5,980	5,626	765	83.89	16.28	12.79	13.60	250	272		
1918	89	594	5,949	5,578	761	84.70	16.18	12.79	13.64	256	273		
1919	89	692	6,421	5,888	726	82.84	14.48	11.31	12.34	226	247		
1920	97	872	8,538	7,991	1,089	83.96	15.99	12.75	13.63	255	273		
1921	92	815	7,782	7,414	1,020	83.09	15.77	13.11	13.76	262	275		
1922	81	530	5,183	4,963	675	83.76	15.44	13.02	13.61	260	272		
1923	89	657	7,006	6,585	881	83.43	15.30	12.57	13.37	251	267		
1924	90	817	7,513	7,075	1,090	85.03	17.19	14.51	15.41	290	308		
1925	88	653	7,423	6,993	913	82.84	14.86	12.30	13.06	246	261		
1926	78	687	7,300	6,782	897	84.03	14.94	12.29	13.23	246	265	74	78
1927	83	732	7,821	7,443	1,093	84.60	16.11	13.98	14.68	280	294	89	76
1928	82	646	7,111	6,880	1,061	85.52	16.73	14.92	15.42	298	308	64	75
1929	78	694	7,366	7,117	1,018	84.46	15.64	13.74	14.22	275	284	111	48
1930	77	783	9,262	8,789	1,208	83.79	15.22	13.00	13.70	260	274	150	60
1931	65	714	7,906	7,659	1,156	84.54	16.18	14.29	14.75	286	295	99	75
1932 [7]		768	8,993		1,308		16.36	14.40		288		110	113

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Year shown is that in which beets were grown. Sugar-making campaign extends into succeeding year.
[2] Including, in some years, a small acreage in Canada used by United States factories.
[3] Includes a small quantity not made from beets, and also that made at the Johnstown, Colo., molasses factory.
[4] Percentages of sucrose (pure sugar) in the total soluble solids of the beets.
[5] Based upon weight of beets sliced, except possibly in a very few factories.
[6] Sucrose actually extracted by factories (as percentage of weight of beets). [7] Preliminary.

TABLE 131.—*Sugar: Production in continental United States, Hawaii, Puerto Rico, and the Philippine Islands, 1909–10 to 1932–33*

Year beginning July	Total cane and beet sugar (refined) [1]	Beet sugar (chiefly refined)	Cane sugar (chiefly raw): Continental United States	Cane sugar (chiefly raw): Puerto Rico	Cane sugar (chiefly raw): Hawaii	Cane sugar (chiefly raw): Philippine Islands	Cane sugar (chiefly raw): Total
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1909–10	1,791,108	512,469	331,726	346,786	517,090	168,254	1,363,856
1910–11	1,955,539	510,172	355,040	349,840	566,821	268,878	1,540,579
1911–12	2,108,510	599,500	360,874	371,076	595,038	281,354	1,608,342
1912–13	2,057,179	692,556	162,573	398,004	546,524	345,077	1,452,178
1913–14	2,304,454	733,401	300,538	351,666	612,000	408,339	1,672,543
1914–15	2,282,021	722,054	246,620	346,490	646,000	421,192	1,660,302
1915–16	2,404,018	874,220	138,620	483,590	592,763	412,274	1,627,247
1916–17	2,590,239	820,657	310,900	503,081	644,663	425,266	1,883,910
1917–18	2,411,263	765,207	245,840	453,794	576,700	474,745	1,751,079
1918–19	2,399,820	760,950	284,400	406,002	600,312	453,346	1,744,060
1919–20	2,259,514	726,451	122,125	485,071	555,727	466,913	1,629,836
1920–21	2,761,304	1,089,021	176,114	489,818	521,579	589,437	1,776,948
1921–22	2,769,970	1,020,489	327,701	408,325	592,000	533,189	1,861,215
1922–23	2,200,865	675,000	295,735	379,172	537,000	475,325	1,687,232
1923–24	2,604,292	881,000	164,823	447,570	691,000	529,091	1,832,484
1924–25	3,252,954	1,090,000	88,483	660,411	769,000	779,510	2,297,404
1925–26	2,923,225	913,000	139,381	603,240	787,246	607,362	2,137,229
1926–27	3,019,707	897,000	47,166	629,134	811,333	766,902	2,254,535
1927–28	3,466,969	1,093,000	70,792	748,677	896,918	807,814	2,524,201
1928–29	3,463,853	1,061,000	132,053	586,761	899,101	933,954	2,551,869
1929–30	3,804,023	1,018,000	200,000	866,110	912,357	981,371	2,959,838
1930–31	3,950,386	1,208,000	184,000	783,163	988,612	958,032	2,913,807
1931–32	4,236,141	1,156,000	157,000	987,674	[2] 1,025,000	[3] 1,102,000	3,271,674
1932–33 [4]	4,448,097	1,308,000	231,000	816,000	[2] 1,008,000	[3] 1,279,000	3,334,000

Bureau of Agricultural Economics. Production data compiled from the following sources: United States from the Department of Agriculture, except cane sugar, 1909–10 and 1910–11 which are from Willet & Gray; Hawaii from Hawaiian Sugar Planters' Association; Puerto Rico and Philippines from official sources of those Islands. Figures for earlier years appear in previous issues of the Yearbook.

[1] Cane sugar, raw, converted to refined basis by multiplying by the following factors: United States, 0.932; Puerto Rico, 0.9393; Hawaii, 0.9358; Philippine Islands, 0.95.
[2] Unofficial. [3] Unofficial estimate of centrifugal only. [4] Preliminary.

TABLE 132.—*Cane sugar: Production of Hawaii, 1913–14 to 1931–32*

Year beginning October	Total acreage in cane	Cane used for sugar: Acreage harvested	Cane used for sugar: Average yield per acre [1]	Cane used for sugar: Production	Sugar produced: As made	Sugar produced: Equivalent refined [2]	Sugar made per short ton of cane	Recovery of equivalent, refined sugar from cane ground [3]
	Acres	*Acres*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Pounds*	*Per cent*
1913–14	----------	112,700	43.5	4,900,000	612,000	573,000	250	11.69
1914–15	239,800	113,200	45.8	5,185,000	646,000	605,000	249	11.67
1915–16	246,332	115,419	42.1	4,859,424	592,763	554,708	244	11.42
1916–17	245,100	123,900	42.1	5,220,000	644,663	603,276	247	11.56
1917–18	276,800	119,600	40.5	4,855,000	576,700	539,676	238	11.12
1918–19	239,900	119,700	39.6	4,744,000	600,312	561,772	253	11.84
1919–20	247,900	114,100	39.2	4,478,000	555,727	520,049	248	11.03
1920–21	236,500	113,100	41.2	4,657,000	521,579	488,004	224	10.48
1921–22	229,000	124,000	41.0	5,088,000	592,000	554,000	233	10.89
1922–23	235,000	114,000	40.0	4,560,000	537,000	503,000	235	11.03
1923–24	232,000	111,000	51.0	5,661,000	691,000	647,000	244	11.43
1924–25	241,000	122,000	51.6	6,297,000	769,000	720,000	244	11.43
1925–26	237,774	122,309	53.1	6,495,686	787,246	736,705	242	11.34
1926–27	234,809	124,542	56.1	6,992,082	811,333	759,245	232	10.86
1927–28	240,769	131,534	58.6	7,707,330	896,918	839,336	233	10.89
1928–29	239,858	129,131	57.7	7,447,494	899,101	841,379	241	11.30
1929–30	242,761	133,840	58.7	7,853,439	912,357	853,784	232	10.87
1930–31	251,533	137,037	61.9	8,485,183	988,612	925,143	233	10.90
1931–32	251,876	139,744	63.4	8,865,323	1,025,354	959,526	231	10.82

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board prior to 1926. Since then data collected through the Hawaiian Sugar Planters' Association.

[1] The growth of 18 to 22 months.
[2] 1 ton of sugar as made is assumed to be equivalent to 0.9358 ton of refined, as tentatively recommended by the joint committee on sugar statistics of the Departments of Commerce and Agriculture.
[3] Based upon tonnage of cane used.

TABLE 133.—*Cane sugar: Production in Louisiana, 1911–1932*

Year [1]	Factories operating	Cane used for sugar: Acreage	Cane used for sugar: Average yield per acre [2]	Cane used for sugar: Production	Sugar produced: As made	Sugar produced: Equivalent refined [3]	Recovery of equivalent refined sugar from cane ground [4]	Sugar made per ton of cane	Molasses made: Total [5]	Molasses made: Per ton of sugar made	Molasses made: Per ton of cane used
	Number	*1,000 acres*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Per cent*	*Pounds*	*1,000 gallons*	*Gallons*	*Gallons*
1911	188	310	19.0	5,887	353	329	5.59	120	35,063	99	6.0
1912	126	197	11.0	2,163	154	144	6.66	142	14,302	93	6.6
1913	153	248	17.0	4,214	293	273	6.48	139	24,046	82	5.7
1914	149	213	15.0	3,199	243	226	7.06	152	17,177	71	5.4
1915	136	183	11.0	2,018	138	129	6.39	137	12,743	92	6.3
1916	150	226	18.0	4,072	304	283	6.95	149	26,154	86	6.4
1917	140	238	16.0	3,813	244	227	5.95	128	30,727	126	8.1
1918	132	232	18.0	4,170	281	262	6.28	135	28,049	100	6.7
1919	121	179	10.5	1,883	121	113	6.00	129	12,991	107	6.9
1920	122	183	13.6	2,493	169	158	6.34	136	16,857	100	6.8
1921	124	226	18.5	4,181	324	302	7.22	155	25,423	78	6.1
1922	112	242	15.6	3,778	295	275	7.28	156	22,719	77	6.0
1923	105	215	11.1	2,387	162	151	6.33	136	15,719	97	6.6
1924	82	162	7.6	1,228	88	82	6.68	143	9,590	109	7.8
1925	91	189	14.0	2,644	139	130	4.92	105	17,783	128	6.7
1926	54	129	6.7	864	47	44	5.09	109	6,614	141	7.7
1927	46	72	13.4	962	71	66	6.86	148	6,624	93	6.9
1928	55	115	16.2	1,860	132	123	6.61	142	13,535	103	7.3
1929	65	155	18.8	2,918	200	186	6.37	137	19,619	98	6.7
1930	61	150	17.1	2,559	184	171	6.68	144	16,887	92	6.6
1931	59	148	15.1	2,232	157	146	6.64	141	14,645	93	6.6
1932 [6]	----------	179	16.2	2,900	231	215	7.41	159	15,660	68	5.4

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Sugar campaign, usually not ended before February following season of growth of cane.
[2] The growth of about 9 months.
[3] 1 ton of sugar as made is assumed to be equivalent to 0.932 ton of refined as tentatively recommended by the joint committee on sugar statistics of the Department of Commerce and the Department of Agriculture.
[4] Based upon tonnage of cane used.
[5] Figures for molasses, 1911–1914, are as reported by the Louisiana Sugar Planters' Association. Figures for later years as reported by Division of Crop and Livestock Estimates. For sirup production see Table 141.
[6] Preliminary.

Table 134.—*Sugar: Production, trade, and supply available for consumption in continental United States, 1909–10 to 1931–32*

IN TERMS OF RAW SUGAR

Year beginning July	Production [1]	Brought in from insular possessions [2]	Imports as sugar [3]	Domestic exports as sugar [4]	Exports in other forms [5]	Apparently available for consumption [6]	
						Total	Per capita
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Pounds*
1909–10	882, 630	927, 752	1, 934, 764	72, 382	24, 351	3, 648, 403	79. 7
1910–11	903, 475	943, 701	1, 845, 279	36, 697	15, 966	3, 639, 891	78. 3
1911–12	1, 005, 337	1, 187, 663	1, 832, 424	60, 380	15, 160	3, 959, 883	83. 9
1912–13	907, 070	1, 026, 972	2, 266, 426	30, 963	19, 217	4, 150, 288	86. 6
1913–14	1, 088, 944	936, 376	2, 403, 252	37, 190	11, 802	4, 439, 489	91. 3
1914–15	1, 022, 828	1, 098, 314	2, 529, 063	302, 641	13, 585	4, 334, 878	87. 9
1915–16	1, 078, 407	1, 102, 057	2, 689, 067	882, 864	12, 213	3, 974, 453	79. 4
1916–17	1, 193, 107	1, 203, 938	2, 527, 984	676, 752	29, 211	4, 219, 066	83. 2
1917–18	1, 068, 437	975, 684	2, 344, 816	305, 429	46, 131	4, 037, 377	78. 5
1918–19	1, 102, 421	1, 073, 044	2, 799, 962	568, 566	36, 747	4, 371, 013	83. 8
1919–20	903, 060	975, 735	3, 812, 955	776, 502	98, 386	4, 816, 862	91. 1
1920–21	1, 346, 811	1, 076, 342	3, 228, 279	319, 589	89, 491	5, 242, 352	97. 6
1921–22	1, 424, 726	1, 340, 867	3, 940, 777	1, 085, 349	31, 397	5, 589, 024	102. 5
1922–23	1, 021, 360	1, 235, 049	4, 068, 205	412, 196	12, 568	5, 899, 849	106. 6
1923–24	1, 111, 898	1, 274, 870	3, 436, 955	152, 883	24, 617	5, 646, 223	100. 5
1924–25	1, 260, 000	1, 645, 319	3, 931, 282	273, 470	22, 436	6, 540, 695	114. 7
1925–26	1, 121, 000	1, 981, 482	3, 895, 947	325, 804	24, 998	6, 647, 627	114. 9
1926–27	1, 011, 000	1, 689, 347	3, 968, 097	124, 555	26, 303	6, 518, 486	111. 1
1927–28	1, 246, 000	2, 051, 659	3, 415, 830	115, 566	29, 833	6, 568, 090	110. 4
1928–29	1, 273, 000	1, 974, 899	4, 115, 601	139, 324	31, 894	7, 192, 282	119. 2
1929–30	*1, 294, 000*	*2, 377, 787*	*2, 823, 173*	*87, 092*	*43, 320*	*6, 364, 548*	*104. 0*
1930–31	1, 482, 000	2, 603, 735	2, 416, 398	77, 131	33, 026	6, 391, 976	103. 4
1931–32	1, 400, 000	2, 813, 113	2, 321, 028	59, 595	28, 532	6, 446, 014	103. 5

IN TERMS OF REFINED SUGAR [7]

Year beginning July	Production [1]	Brought in from insular possessions [2]	Imports as sugar [3]	Domestic exports as sugar [4]	Exports in other forms [5]	Total	Per capita
1921–22	1, 325, 906	1, 200, 894	3, 686, 397	1, 009, 377	29, 182	5, 234, 638	96. 0
1922–23	950, 625	1, 161, 351	3, 805, 745	383, 439	11, 682	5, 522, 600	99. 8
1923–24	1, 034, 615	1, 198, 777	3, 214, 883	142, 217	22, 943	5, 283, 115	94. 0
1924–25	1, 172, 000	1, 547, 587	3, 674, 563	254, 391	20, 911	6, 118, 848	107. 3
1925–26	1, 043, 000	1, 859, 332	3, 634, 323	303, 073	23, 298	6, 210, 284	107. 4
1926–27	941, 000	1, 588, 981	3, 714, 054	115, 865	24, 514	6, 103, 656	104. 0
1927–28	1, 159, 000	1, 930, 732	3, 196, 443	107, 704	27, 805	6, 150, 666	103. 3
1928–29	1, 184, 000	1, 858, 331	3, 851, 311	129, 846	29, 726	6, 734, 070	111. 6
1929–30	1, 204, 000	2, 239, 140	2, 641, 709	81, 167	40, 375	5, 963, 307	97. 5
1930–31	1, 379, 000	2, 451, 611	2, 261, 187	71, 884	30, 781	5, 989, 133	96. 9
1931–32	1, 301, 000	2, 648, 129	2, 171, 882	55, 541	26, 592	6, 038, 878	97. 0

Bureau of Agricultural Economics. Trade figures from the Bureau of Foreign and Domestic Commerce.

[1] Beet and cane sugar only.
[2] Duty free, from Hawaii, Puerto Rico, and the Philippine Islands (Virgin Islands included in 1917 and subsequently).
[3] No account taken of sugar imported in other forms. Imports from the Philippine Islands excluded, reexports deducted.
[4] Shipments to Hawaii and Puerto Rico included. Direct exports to foreign countries from Hawaii and Puerto Rico excluded.
[5] Sugar used in the manufacture of other commodities for export on which drawback was paid.
[6] No account taken of stocks at the beginning or end of year.
[7] Raw sugar converted to refined by multiplying by the following factors: Cuba and Hawaii, 0.9358; Puerto Rico, 0.9393; Philippines, 0.95; all others (Santo Domingo, British West Indies, Louisiana, etc.), 0.932. Use reciprocal of above factors to reduce refined sugar to raw.

TABLE 135.—*Sugar, raw, cane and beet: World production, 1909–10 to 1932–33*

Crop year [1]	Estimated world total	Estimated world total cane sugar	Estimated world total beet sugar	Production in selected countries: United States [2]	Cuba	India [3]	Java [4]	Germany [5]	Czechoslovakia	Poland [6]	France [7]
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
1909-10	16, 828	9, 670	7, 158	883	2, 021	2, 481	1, 411	2, 147	----------	--------	861
1910-11	18, 834	9, 870	8, 964	903	1, 661	2, 587	1, 617	2, 770	----------	--------	763
1911-12	17, 908	10, 622	7, 286	1, 005	2, 124	2, 745	1, 550	1, 552	----------	--------	646
1912-13	20, 542	10, 896	9, 646	907	2, 720	2, 862	1, 616	2, 902	----------	--------	1, 029
1913-14	21, 154	11, 640	9, 514	1, 089	2, 909	2, 573	1, 649	2, 896	----------	--------	841
1914-15	20, 875	11, 952	8, 923	1, 023	2, 922	2, 736	1, 454	2, 721	----------	376	355
1915-16	18, 885	12, 278	6, 607	1, 078	3, 398	2, 949	1, 797	1, 678	----------	239	159
1916-17	18, 592	13, 255	5, 337	1, 193	3, 422	3, 093	2, 009	1, 721	----------	203	217
1917-18	20, 293	14, 790	5, 503	1, 068	3, 890	3, 839	1, 900	1, 726	----------	263	235
1918-19	18, 604	14, 076	4, 528	1, 102	4, 491	2, 752	1, 473	1, 207	[8] 714	249	120
1919-20	17, 989	14, 338	3, 651	903	4, 184	3, 404	1, 681	774	553	106	182
1920-21	19, 546	14, 225	5, 321	1, 347	4, 408	2, 825	1, 853	1, 105	797	195	359
1921-22	20, 578	15, 095	5, 483	1, 425	4, 517	2, 928	1, 994	1, 434	731	170	326
1922-23	20, 860	15, 127	5, 733	1, 022	4, 083	3, 410	1, 981	1, 604	811	335	522
1923-24	22, 810	16, 306	6, 504	1, 112	4, 606	3, 715	2, 201	1, 263	1, 115	423	524
1924-25	26, 670	17, 712	8, 958	1, 260	5, 812	2, 852	2, 535	1, 724	1, 574	540	919
1925-26	27, 989	18, 813	9, 176	1, 120	5, 524	3, 334	2, 175	1, 703	1, 662	638	831
1926-27	26, 624	18, 125	8, 499	1, 011	5, 050	3, 659	2, 639	1, 834	1, 153	634	786
1927-28	28, 515	18, 671	9, 844	1, 246	4, 527	3, 603	3, 238	1, 846	1, 383	658	956
1928-29	30, 655	20, 319	10, 336	1, 273	5, 775	3, 035	3, 198	2, 054	1, 165	824	999
1929-30	30, 607	20, 459	10, 148	1, 294	5, 231	3, 002	3, 245	2, 188	1, 142	1, 010	1, 011
1930-31	31, 858	19, 116	12, 742	1, 482	3, 495	3, 604	3, 095	2, 808	1, 260	863	1, 324
1931-32 [9]	29, 321	19, 809	9, 512	1, 400	2, 015	4, 446	2, 821	1, 758	896	544	942
1932-33 [9]	26, 860	18, 165	8, 695	1, 629	2, 240	5, 209	[10] 1, 433	1, 157	686	469	990

Bureau of Agricultural Economics. Estimated world total sugar production for the period 1895-96 to 1908-09 in Agricultural Yearbook, 1924, p. 808.

[1] *Figures are for the crop years 1909-10 to 1932-33 for the countries in which the sugar production season begins in the fall months and is completed during the following calendar year, except in certain cane-sugar producing countries where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1909 to 1932.*

[2] Production of cane and beet sugar in terms of raw sugar.

[3] The figures quoted for India are for the production of gur, a low grade of sugar polarizing between 50° and 60°. Practically the entire crop is consumed within the country.

[4] All grades of sugar reduced to terms of head sugar, a grade of sugar which contains at least 96.5 per cent sucrose. Figures for Java are for the calendar years 1910-1933.

[5] Figures for 1909-10 to 1917-18 are for pre-war boundaries.

[6] Figures are incomplete through 1920-21; 1914-15 includes Prussian Poland only; 1915-16 to 1919-20 include Prussian Poland and Congress Poland; 1920-21 includes Prussian Poland, Congress Poland, and Galicia.

[7] Figures for 1909-10 to 1918-19 refer to pre-war boundaries; 1914-15 to 1918-19 are exclusively of invaded territory.

[8] Bohemia, Moravia, and Silesia only.

[9] Preliminary.

[10] Unofficial estimate.

Table 136.—*Sugar: Production in specified countries, average 1921–22 to 1925–26, annual 1928–29 to 1932–33*

BEET SUGAR IN TERMS OF RAW SUGAR

Country	Average 1921–22 to 1925–26	1928–29	1929–30	1930–31	1931–32[1]	1932–33[1]
NORTH AMERICA	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Canada	31, 908	36, 735	39, 432	53, 764	60, 875	[2] 52, 500
United States	984, 600	1, 141, 000	1, 094, 000	1, 298, 600	1, 243, 000	1, 398, 000
Total	1, 016, 508	1, 177, 735	1, 133, 432	1, 352, 364	1, 303, 875	1, 450, 500
EUROPE						
England and Wales	24, 385	240, 851	362, 757	526, 062	313, 000	360, 000
Scotland	(3)	1, 836	713	1, 758		
Irish Free State	(3)	24, 295	25, 557	23, 390	6, 257	28, 000
Sweden	175, 564	177, 415	134, 203	205, 767	158, 304	243, 800
Denmark	142, 726	179, 014	140, 874	175, 656	127, 492	204, 000
Netherlands	324, 273	346, 849	286, 170	316, 200	184, 399	248, 000
Belgium	346, 094	303, 213	273, 426	306, 894	221, 113	254, 500
France	624, 498	999, 249	1, 010, 848	1, 324, 308	942, 481	990, 000
Spain	199, 414	237, 476	246, 426	318, 449	397, 690	240, 266
Italy	308, 261	432, 908	496, 135	474, 904	417, 383	348, 263
Switzerland	6, 698	7, 738	6, 760	6, 300	6, 700	6, 900
Germany	1, 557, 556	2, 054, 218	2, 187, 795	2, 808, 076	1, 757, 960	1, 157, 000
Austria	53, 192	118, 300	132, 708	165, 642	179, 179	193, 000
Czechoslovakia	1, 178. 534	1, 164, 525	1, 141, 638	1, 259, 684	896, 055	685, 710
Hungary	139, 801	242, 579	272, 083	258, 127	138, 064	116, 000
Yugoslavia	63, 482	140, 600	143, 789	116, 316	95, 132	82, 926
Bulgaria	22, 044	30, 071	40, 800	60, 205	28, 126	28, 590
Rumania	76, 698	160, 744	118, 150	181, 009	56, 900	73, 000
Poland	421, 338	823, 714	1, 009, 597	862, 636	543, 977	459, 000
Latvia	(3)	810	3, 888	8, 322	13, 230	28, 700
Lithuania	(3)	(3)	(3)	(3)	7, 231	15, 000
Finland	1, 407	3, 315	2, 790	4, 079	4, 633	7, 300
Russia	474, 700	1, 413, 000	907, 000	1, 914, 400	1, 650, 000	1, 410, 000
Turkey[4]	(3)	30, 000	38, 000	38, 400	25, 200	29, 200
Total	6, 140, 665	9, 132, 720	8, 982, 087	11, 356, 584	8, 170, 506	7, 209, 155
ASIA						
Japan:						
Hokkaido	9, 995	22, 724	28, 064	26, 583	29, 598	29, 118
Chosen	625	709	733	1, 109	1, 822	----------
Total	10, 620	23, 433	28, 797	27, 692	31, 420	----------
OCEANIA						
Australia	3, 021	2, 348	3, 186	5, 706	5, 878	----------
Total world beet sugar[5]	7, 170, 814	10, 336, 236	10, 147, 502	12, 742, 346	9, 511, 679	[6] 8, 694, 773

CANE SUGAR (RAW)

Country	Average 1921–22 to 1925–26	1928–29	1929–30	1930–31	1931–32[1]	1932–33[1]
NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES						
United States	203, 224	132, 053	199, 609	183, 693	156, 617	231, 000
Hawaii	675, 249	899, 101	912, 357	988, 612	[2] 1, 025, 352	[2] 1, 008, 000
Puerto Rico	490, 751	586, 761	866, 110	783, 163	987, 674	816, 295
Virgin Islands	5, 535	2, 875	[2] 6, 424	[2] 2, 000	[2] 4, 577	[2] 5, 600
Central America:						
Guatemala	21, 733	33, 402	[2] 37, 408	[2] 40, 249	[2] 36, 000	[2] 33, 600
Nicaragua	14, 457	10, 000	16, 000	----------	----------	----------
Salvador	21, 200	23, 148	[2] 27, 600	51, 210	33, 289	----------
Mexico	179, 150	201, 831	[2] 235, 000	[2] 287, 285	[2] 242, 947	[2] 232, 600
West Indies (British):						
Antigua	13, 340	[2] 12, 258	[2] 20, 776	[2] 5, 826	[2] 21, 538	[2] 29, 000
Barbados	56, 200	73, 378	56, 498	66, 690	[2] 92, 774	[2] 89, 600
Jamaica	39, 888	64, 549	75, 313	[2] 62, 272	[2] 70, 840	[2] 62, 700
St. Christopher	13, 985	15, 371	20, 922	13, 464	[2] 22, 365	[2] 22, 400
Trinidad	66, 483	100, 717	89, 430	110, 402	109, 310	[2] 112, 000
Cuba	4, 908, 638	5, 775, 179	5, 231, 490	3, 495, 292	2, 914, 616	2, 240, 000
Dominican Republic	281, 846	396, 575	401, 576	394, 609	478, 936	[2] 470, 000
Haiti	10, 158	13, 996	[2] 21, 176	[2] 21, 068	[2] 23, 461	[2] 24, 600

See footnotes at end of table.

TABLE 136.—*Sugar: Production in specified countries, average 1921–22 to 1925–26, annual 1928–29 to 1932–33*—Continued

CANE SUGAR (Raw)—Continued

Country	Average 1921–22 to 1925–26	1928–29	1929–30	1930–31	1931–32[1]	1932–33[1]
NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES—continued						
West Indies (French):	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Guadeloupe	32, 674	2, 590	30, 144	[2] 27, 328	[2] 39, 199	[2] 33, 600
Martinique	33, 573	[2] 42, 056	[2] 42, 038	[2] 42, 029	[2] 46, 883	[2] 40, 000
Total North American and Central American countries and West Indies reporting all years	7, 041, 422	8, 352, 692	8, 246, 271	6, 523, 982	6, 273, 089	5, 450, 095
EUROPE AND ASIA						
Spain	8, 738	14, 949	[2] 15, 189	[2] 25, 008	[2] 28, 373	[2] 26, 500
India [7]	3, 247, 800	3, 035, 000	3, 092, 000	3, 604, 000	4, 446, 000	5, 209, 000
Taiwan	471, 748	870, 077	893, 396	878, 847	1, 087, 975	752, 504
Japan	91, 569	110, 532	106, 986	88, 153	103, 586	88, 000
Java [8]	2, 113, 004	3, 197, 927	3, 245, 288	3, 095, 270	2, 820, 721	1, 433, 000
Philippine Islands	584, 895	933, 954	981, 371	958, 032	[9] 1, 102, 107	[9] 1, 279, 000
Total European and Asiatic countries reporting all years [10]	*5, 932, 859*	*7, 228, 485*	*7, 352, 859*	*7, 691, 278*	*8, 486, 655*	*7, 509, 004*
SOUTH AMERICA						
Argentina	288, 008	412, 947	375, 310	420, 854	381, 914	382, 906
Brazil	904, 456	1, 066, 301	1, 124, 679	1, 032, 787	[2] 1, 090, 000	[2] 1, 064, 000
British Guiana	112, 297	131, 324	143, 096	141, 280	[2] 131, 900	[2] 134, 000
Dutch Guiana	12, 469	19, 883	14, 069	[2] 18, 500	[2] 16, 000	[2] 19, 000
Ecuador	17, 603	25, 370	21, 008	23, 208	21, 160	[2] 22, 000
Peru	354, 567	398, 741	465, 563	470, 000	438, 395	[2] 441, 000
Venezuela	21, 423	[2] 22, 000	[2] 25, 000	[2] 21, 999	[2] 20, 000	[2] 23, 000
Total	1, 710, 823	2, 076, 566	2, 168, 725	2, 128, 628	2, 097, 369	2, 084, 966
AFRICA						
Egypt	100, 264	122, 026	118, 377	134, 260	[2] 162, 474	[2] 140, 000
Mauritius	243, 069	279, 360	262, 386	243, 564	180, 788	[2] 273, 000
Union of South Africa	182, 420	295, 934	298, 635	393, 000	325, 899	349, 950
Portuguese East Africa	*53, 219*	*100, 786*	*87, 937*	*[2] 85, 421*	*[2] 97, 000*	*[2] 95, 000*
Reunion	52, 015	42, 211	56, 243	55, 572	[2] 47, 312	[2] 58, 000
Madagascar	2, 168	4, 894	5, 534	5, 181	7, 496	9, 370
Total	633, 155	845, 211	829, 112	916, 998	820, 969	925, 320
OCEANIA						
Australia	411, 638	602, 083	602, 654	599, 899	672, 131	[2] 616, 000
Fiji	71, 984	[2] 110, 525	98, 236	104, 000	[2] 89, 000	[2] 117, 600
Total	483, 622	712, 608	700, 890	703, 899	761, 131	733, 600
Total cane sugar producing countries reporting all years	*15, 801, 881*	*19, 215, 562*	*19, 297, 857*	*17, 964, 785*	*18, 439, 213*	*16, 703, 885*
Estimated world total, cane sugar [5]	16, 610, 000	20, 319, 000	20, 459, 000	19, 116, 000	19, 809, 000	18, 165, 000
Total world cane and beet sugar production in countries reporting all years	*22, 972, 695*	*29, 551, 798*	*29, 445, 359*	*30, 707, 131*	*27, 950, 892*	*25, 398, 658*
Estimated world total cane and beet sugar [5]	23, 781, 000	30, 655, 000	30, 607, 000	31, 858, 000	29, 321, 000	26, 860, 000

Bureau of Agricultural Economics. Official sources, International Institute of Agriculture and sugar associations estimates except as otherwise stated. Figures are for the crop years 1921–22 to 1932–33 for the countries in which the sugar-harvesting season begins in the fall months and is completed the following calendar year, except in certain canesugar producing countries in the Southern Hemisphere, such as Argentina, Australia, Mauritius, Union of South Africa, etc., where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1921 to 1932.

[1] Preliminary.
[2] *Unofficial estimate.*
[3] No sugar produced.
[4] Includes Turkey in Asia.
[5] Exclusive of production in minor producing countries for which no statistics are available.
[6] Includes rough estimates for Chosen and Australia.
[7] The figures quoted for India are for the production of gur, a low grade of sugar polarizing between 50° and 60°. Practically the entire crop is consumed within the country.
[8] *All grades of sugar reduced to terms of head sugar*, a grade of sugar which contains at least 96.5 per cent sucrose. Figures for Java are for the calendar years 1922 to 1932.
[9] Unofficial estimate of production of centrifugal sugar, which usually accounts for about 90 per cent of the total sugar production.
[10] *Production in the Philippine Islands is not included* in this total as the figures quoted for the last 2 years are not comparable with earlier years.

TABLE 137.—*Sugar: International trade, average, 1925–1929; annual, 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Cuba	5, 048, 092	525	4, 389, 253	135	5, 543, 887	79	3, 598, 333	37	2, 997, 603	-----------
Dutch East Indies	2, 380, 762	3, 634	2, 827, 302	3, 772	2, 680, 686	3, 825	2, 468, 948	3. 652	[3] 1, 739, 177	234
Czechoslovakia	792, 566	628	819, 545	77	595, 686	109	571, 962	3, 331	498, 973	235
Philippine Islands	612, 280	2, 398	628, 242	4, 887	767, 055	2, 138	820, 089	1, 046	829, 957	1, 601
Dominican Republic	353, 915	196	383, 664	17	355, 574	7	386, 621	6	353, 239	-----------
Peru	332, 668	106	337, 270	24	400, 553	107	373, 442	124	303, 768	-----------
Poland	253, 202	2, 291	204, 675	38	328, 309	11, 087	435, 378	11, 977	379, 977	8, 224
Mauritius	242, 199	[3] 3	241, 695	[3] 3	306, 250	[3] 2	204, 520	[3] 9	-----------	-----------
Australia [2]	179, 533	911	232, 667	33	216, 394	27	211, 034	1	-----------	-----------
Germany	174, 357	92, 758	85, 161	138, 113	242, 455	30, 828	328, 458	18, 876	390, 677	14, 411
Belgium	152, 164	77, 890	109, 906	86, 349	127, 013	88, 799	79, 239	74, 797	57, 806	53, 165
British Guiana	113, 607	447	128, 449	536	112, 503	361	128, 287	192	133, 668	116
Russia	[3] 105, 024	57, 858	[3] 150, 347	2	[3] 139, 720	40, 086	[2] 112, 291	342, 155	-----------	-----------
Fiji	92, 836	171	135, 165	172	80, 048	290	101, 896	193	76, 089	190
Hungary	90, 488	417	78, 013	694	133, 851	862	117, 745	732	57, 756	135
Union of South Africa	82, 951	10, 307	90, 389	17, 977	122, 740	19, 867	183, 482	10, 126	183, 127	2, 956
Trinidad and Tobago	72, 520	1, 564	83, 006	2, 056	91, 284	1, 607	77, 435	1, 010	95, 836	46
Barbados	61, 524	517	70, 242	628	73, 379	449	56, 498	-----------	-----------	-----------
Reunion	54, 035	26	[3] 39, 516	[3] 132	[3] 41, 447	[3] 0	[3] 46, 933	0	-----------	-----------
Jamaica	49, 676	1, 081	54, 562	1, 102	41, 866	1, 373	56, 419	555	-----------	-----------
Mozambique	37, 906	93	40, 060	377	55, 299	14	76, 686	39	83, 310	67
Brazil	25, 076	20	33, 116	3	16, 400	0	93, 007	4	12, 240	1
Argentina	23, 426	17, 264	37, 775	1, 246	10, 034	1, 979	4, 690	5, 083	4, 455	3, 954
Madagascar	3, 897	3, 768	4, 659	3, 960	5, 500	4, 237	4, 784	3, 618	5, 751	3, 912
Total	11, 334, 684	274, 873	11, 204, 679	262, 233	12, 488, 842	208, 131	10, 538, 326	477, 563	8, 282, 909	89, 236
PRINCIPAL IMPORTING COUNTRIES										
United States	167, 360	4, 428, 566	122, 587	3, 868, 804	102, 639	4, 888, 389	77, 814	3, 495, 113	52, 577	3, 176, 289
United Kingdom	105, 263	2, 135, 293	83, 825	2, 150, 189	186, 766	2, 351, 404	312, 589	2, 141, 092	119, 068	2, 048, 880
British India	40, 064	904, 568	44, 761	930, 251	42, 962	1, 034, 930	48, 487	1, 014, 130	20, 307	698, 310
China	2, 072	823, 225	1, 542	916, 132	665	959, 428	252	812, 404	220	716, 628
Canada	89, 914	524, 446	27, 555	477, 711	20, 799	475, 490	13, 906	472, 706	8, 771	475, 762
France	251, 691	460, 753	282, 929	488, 067	331, 457	562, 430	308, 762	453, 063	297, 215	372, 246
Japan	204, 103	414, 134	256, 052	423, 395	217, 615	251, 020	244, 568	269, 693	176, 146	218, 611
Netherlands	284, 204	316, 951	227, 232	307, 109	122, 542	188, 931	106, 270	198, 641	36, 366	125, 990

Switzerland	74	148, 736	85	158, 532	97	163, 479	188	166, 365	523	176, 465
Chile	133	136, 205	200	149, 113	159	168, 181	147	126, 390		113, 963
British Malaya	31, 068	125, 180	32, 135	125, 176	21, 297	128, 229	15, 585	126, 473	12, 954	112, 358
Morocco	0	121, 576	0	128, 314	0	146, 913	0	142, 492	0	152, 888
Austria	663	114, 983	617	118, 737	685	123, 377	558	89, 632	146	44, 301
Sweden	18	110, 608	18	103, 628	55	158, 566	90	94, 037	74	93, 104
Irish Free State	0	92, 080	0	90, 115	0	88, 518	0	92, 108	0	91, 120
Finland	0	87, 238	0	101, 485	0	101, 349	0	134, 417	0	77, 578
Portugal	102	86, 255	105	94, 066	80	78, 784	37	71, 106		
Persia [4]	99	82, 505	9	84, 399	8	100, 175	3	89, 188		
New Zealand	739	81, 102	867	89, 497	1, 062	78, 665	1, 222	96, 579	997	85, 056
Norway	0	79, 493	0	80, 109	0	83, 705	0	93, 112	0	89, 931
Egypt	9, 341	79, 282	5, 704	77, 881	7, 256	107, 974	5, 146	143, 326	4, 087	4, 578
Italy	4, 778	66, 744	4	118, 438	5	14, 622	14, 361	20, 700	11, 081	14, 998
Greece	[5] 12	64, 751	23	67, 075		69, 765		70, 499		68, 680
Algeria	151	63, 315	451	70, 572	68	75, 502	113	81, 266		76, 882
Ceylon	1	61, 046	0	69, 030	1	72, 242	0	80, 102	0	79, 750
Siam [6]	1, 648	46, 472	243	44, 164	39	49, 447	2	57, 212		
Uruguay	0	43, 221	0	37, 338	0	49, 332	0	48, 854		
Latvia	20	41, 655	[3] 0	46, 559	[3] 70	45, 689	0	56, 266		
Denmark	3, 148	29, 841	605	43, 603	626	42, 862	183	48, 991	192	49, 850
Tunis	0	29, 742	0	31, 841	0	37, 478	0	41, 334	0	36, 700
Lithuania	25	25, 731	26	27, 501	95	29, 796	250	34, 418		28, 217
Anglo-Egyptian Sudan	0	23, 812	0	26, 766	0	32, 976	0	34, 442	0	26, 300
Taiwan	13, 346	18, 109	8, 744	8, 374	2, 967	1, 642	408	171		
Yugoslavia	4, 654	7, 320	0	16, 108	14, 655	3, 102	8, 858	2, 072	0	1, 608
Gold Coast	0	*5, 554*	0	*6, 704*	*0*	*5, 994*	*0*	*5, 791*	*0*	*4, 239*
Total	1, 214, 711	11, 880, 522	1, 096, 319	11, 576, 683	1, 074, 670	12, 770, 395	1, 159, 799	10, 904, 245	749, 724	9, 261, 252

Bureau of Agricultural Economics, official sources except where otherwise noted. The following kinds and grades have been included under the head of sugar: Brown, white, candied, caramel, chancaca (Peru), crystal cube, maple, muscovado, panela. The following have been excluded: Candy (meaning confectionery), confectionery, glucose, grape sugar, jaggery, molasses, and sirups.

[1] Preliminary.
[2] Java and Madura only.
[3] International Yearbook of Agricultural Statistics.
[4] Year ended Mar. 20 of following year.
[5] 2-year average.
[6] Year ended Mar. 31 of following year.

TABLE 138.—*Sugar, raw (96° centrifugal): Average wholesale price per pound, New York, 1923–1932* [1]

Year	Jan.	Feb.[2]	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [2]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	5.3	6.2	7.3	7.8	7.9	7.4	6.9	6.1	7.0	7.6	7.3	7.3	7.0
1924	6.7	7.2	6.9	6.4	5.6	5.1	5.1	5.4	6.0	6.0	5.8	5.3	6.0
1925	4.6	4.6	4.7	4.5	4.3	4.4	4.3	4.4	4.3	3.9	4.0	4.1	4.3
1926	4.2	4.2	4.0	4.1	4.2	4.1	4.2	4.2	4.4	4.6	4.7	5.1	4.3
1927	5.1	4.9	4.8	4.8	4.8	4.6	4.5	4.5	4.8	4.7	4.7	4.6	4.7
1928	4.5	4.3	4.5	4.5	4.5	4.3	4.2	4.1	4.2	3.9	3.9	3.9	4.2
1929	3.8	3.7	3.7	3.7	3.6	3.5	3.8	3.8	4.0	4.0	3.8	3.8	3.8
1930	3.7	3.7	3.6	3.5	3.2	3.2	3.3	3.2	3.1	3.3	3.4	3.3	3.4
1931	3.4	3.3	3.3	3.3	3.2	3.3	3.5	3.5	3.4	3.4	3.4	3.2	3.3
1932	3.1	2.9	2.8	2.6	2.6	2.8	3.0	3.2	3.1	3.2	3.0	2.9	2.9

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890–1922 are available in 1921 Yearbook, p. 810, Table 388.

[1] Quotations are on basis of duty paid.
[2] Derived from the figures upon which the monthly averages are based.

TABLE 139.—*Sugar, granulated: Average retail price per pound, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	8.3	8.7	10.2	10.6	11.2	11.1	10.5	9.6	9.6	10.6	10.3	10.4	10.1
1924	10.2	10.3	10.4	9.9	9.2	8.3	8.4	8.2	8.6	8.8	8.8	8.8	9.2
1925	8.1	7.7	7.7	7.5	7.2	7.2	7.1	7.0	7.0	6.8	6.6	6.7	7.2
1926	6.7	6.7	6.7	6.6	6.7	6.9	6.9	7.0	7.0	7.1	7.1	7.3	6.9
1927	7.5	7.5	7.4	7.3	7.3	7.3	7.4	7.3	7.2	7.2	7.2	7.1	7.3
1928	7.1	7.1	7.1	7.1	7.2	7.3	7.3	7.1	7.0	6.9	6.8	6.7	7.1
1929	6.7	6.6	6.5	6.4	6.4	6.4	6.4	6.6	6.7	6.7	6.7	6.6	6.6
1930	6.6	6.5	6.4	6.3	6.3	6.1	6.1	6.1	5.9	5.8	5.9	5.9	6.2
1931	5.9	5.9	5.8	5.7	5.6	5.6	5.6	5.7	5.7	5.6	5.6	5.5	5.7
1932	5.4	5.3	5.2	5.1	4.9	4.9	5.0	5.1	5.1	5.1	5.1	5.1	5.1

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics retail prices. Data for 1913–1922 available in 1930 Yearbook, p. 704, Table 162.

TABLE 140.—*Sorgo sirup: Acreage, yield, production, and December 1 price, by States, 1930–1932*

State	Acreage harvested			Yield per acre			Production			Price per gallon received by producers Dec. 1	
	1930	*1931*	*1932* [1]	*1930*	*1931*	*1932*	*1930*	*1931*	*1932* [1]	*1931*	*1932*
	1,000 acres	*1,000 acres*	*1,000 acres*	*Gallons*	*Gallons*	*Gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*Cents*	*Cents*
Indiana	2	3	2	47	65	75	94	195	150	60	49
Illinois	2	2	2	51	72	72	102	144	144	67	50
Iowa	2	3	2	100	90	85	200	270	170	87	60
Missouri	10	12	10	45	55	53	450	660	530	62	47
Kansas	2	4	4	40	50	45	80	200	180	71	50
Virginia	2	3	4	40	70	50	80	210	200	67	55
North Carolina	*22*	*29*	*28*	*60*	*73*	*60*	*1,320*	*2,117*	*1,680*	*53*	*48*
South Carolina	7	9	10	50	54	54	350	486	540	48	45
Georgia	12	16	18	62	61	64	744	976	1,152	43	38
Kentucky	12	18	13	40	70	56	480	1,260	728	49	42
Tennessee	18	28	24	48	65	52	864	1,820	1,248	40	33
Alabama	31	54	57	65	75	69	2,015	4,050	3,933	32	32
Mississippi	14	25	26	68	88	74	952	2,200	1,924	30	28
Arkansas	12	20	15	38	70	52	456	1,400	780	40	37
Oklahoma	1	10	5	25	45	46	25	450	230	45	36
Texas	16	23	30	44	60	54	704	1,380	1,620	49	38
United States	*165*	*259*	*250*	*54.0*	*68.8*	*60.8*	*8,916*	*17,818*	*15,200*	*43.0*	*37.8*

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 141.—*Sugarcane sirup: Acreage, yield, production, and December 1 price, by States, 1930–1932*

State	Acreage harvested			Yield per acre			Production			Price per gallon received by producers Dec. 1	
	1930	1931	1932 [1]	1930	1931	1932	1930	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Gallons*	*Gallons*	*Gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*Cents*	*Cents*
South Carolina	5	5	6	118	80	82	590	400	492	60	56
Georgia	28	28	31	130	100	150	3,640	2,800	4,650	50	39
Florida	9	9	10	170	165	160	1,530	1,485	1,600	50	36
Alabama	18	20	22	120	93	120	2,160	1,860	2,640	55	42
Mississippi	15	14	17	120	150	166	1,800	2,100	2,822	55	42
Arkansas	1	1	1	54	140	102	54	140	102	69	58
Louisiana	22	19	20	282	239	242	6,208	4,545	4,844	[2] 39	[2] 32
Texas	6	7	7	142	147	147	852	1,029	1,029	70	50
United States	104	103	114	161.9	139.4	159.5	16,834	14,359	18,179	40.8	39.3

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board

[1] Preliminary.
[2] Average price, crop marketing season.

TABLE 142.—*Maple sugar and sirup: Production in important States, 1917–1932*

Year	Trees tapped	Sugar made	Sirup made	Total product in terms of sugar [1]	Average total product per tree		Average price received by producers for crop marketing season	
					As sugar [1]	As sirup [1]	Per pound of sugar	Per gallon of sirup
	1,000 trees	*1,000 pounds*	*1,000 gallons*	*1,000 pounds*	*Pounds*	*Gallons*	*Cents*	*Dollars*
1917	17,313	10,525	4,258	44,589	2.58	0.32		
1918	19,132	12,944	4,863	51,848	2.71	.34		
1919	18,799	9,787	3,804	40,210	2.14	.27		
1920	18,895	7,324	3,580	35,964	1.90	.24		
1921	15,114	4,730	2,386	23,818	1.58	.20		
1922	16,274	5,147	3,640	34,267	2.11	.28		
1923	15,291	4,685	3,605	33,525	2.19	.27		
1924	15,407	4,078	3,903	35,302	2.29	.29	0.28	2.02
1925	15,313	3,236	3,089	27,946	1.82	.23	.27	2.10
1926	14,712	3,569	3,737	33,465	2.27	.28	.29	2.16
1927	14,603	3,133	3,671	32,501	2.23	.28	.29	2.09
1928	14,388	2,317	3,007	26,373	1.83	.23	.29	2.05
1929	12,795	1,344	2,346	20,112	1.57	.20	.30	2.03
1930	13,002	2,338	3,607	31,194	2.40	.30	.30	2.02
1931	12,079	1,616	2,186	19,104	1.58	.20	.26	1.72
1932 [2]	12,033	1,601	2,394	20,753	1.72	.22	.25	1.60

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] 1 gallon of sirup taken as equivalent to 8 pounds of sugar.
[2] Preliminary.

TABLE 143.—*Maple sugar and sirup: Production, by States, 1929–1932*

State	Trees tapped				Sugar made				Sirup made			
	1929	1930	1931	1932 [1]	1929	1930	1931	1932 [1]	1929	1930	1931	1932 [1]
	1,000 trees	*1,000 trees*	*1,000 trees*	*1,000 trees*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 gals.*	*1,000 gals.*	*1,000 gals.*	*1,000 gals.*
Maine	255	255	255	260	24	40	9	9	40	38	26	33
New Hampshire	378	382	390	413	109	154	78	100	88	93	56	83
Vermont	5,535	5,646	5,194	5,454	690	1,195	830	878	1,090	1,368	578	981
Massachusetts	268	268	252	257	37	110	34	71	44	80	43	65
New York	3,613	3,682	3,229	3,132	298	613	324	341	613	1,120	577	695
Pennsylvania	802	794	722	664	105	120	161	142	133	322	234	164
Ohio	1,208	1,214	1,256	1,105	39	55	96	19	205	368	440	220
Michigan	493	503	508	467	34	39	73	33	79	146	156	98
Wisconsin	243	258	273	281	8	12	11	8	54	72	76	55
United States	12,795	13,002	12,079	12,033	1,344	2,338	1,616	1,601	2,346	3,607	2,186	2,394

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 144.—*Honey: Monthly average price in producing sections and at consuming markets, 1927–1932*

EXTRACTED HONEY, PER POUND

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
CALIFORNIA WHITE TO WATER WHITE ORANGE												
F. o. b. southern California shipping points:[1]	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1927	------	7¾	9	8¾	8	8¼	8¾	9	9¼	9½	9½	10
1928	10	10	10	9½	8¾	8¾	9	9¼	9¼	9½	9¾	9½
1929	9¾	9¾	9½	9½	10	10¼	11	11¼	11	11	12	------
1930	12¾	12½	13½	10½	8¼	8	7½	7½	7¼	7½	7½	7¾
1931	7¼	7⅛	7¼	6⅜	6½	6¼	6¼	6⅜	6¼	6½	6⅜	6½
1932	6	6	5⅝	4⅞	4½	4½	4¼	4⅜	4⅜	5⅛	5¾	5⅞
New York City:[2]												
1927	12½	12½	11	------	11	11¼	11½	12¾	13	12¾	13	13
1928	------	------	------	------	12½	12½	12½	12½	12¾	13	12¾	12½
1929	12½	12½	12½	12½	12½	12½	12½	12¾	13	13½	13½	13½
1930	13½	13½	13½	13½	------	12¼	12¼	12⅜	12⅝	12½	12¼	12
1931	11¾	11½	11¼	11	11	10½	10½	10½	11	11	10¼	10⅜
1932	9½	9½	9½	9½	9½	9½	9½	8¾	8⅜	8¾	9	8¾
INTERMOUNTAIN WHITE TO WATER WHITE SWEET CLOVER AND ALFALFA												
F. o. b. intermountain points:[3]												
1927	6¾	6½	6	5¾	5¾	6	6	6¾	7	7½	7¾	7¼
1928	7¼	7½	7¼	7¼	7¼	7	7¼	7	7¼	7¼	7	7
1929	7⅛	7⅛	7⅜	7⅝	7¾	7½	7	7⅜	7¼	7⅛	7¼	7⅛
1930	7¼	7¼	7	6⅞	6½	5¾	6¼	6½	5¾	5½	5⅜	5¾
1931	5¼	5½	5½	5⅛	4⅞	4⅝	5⅛	5⅛	5⅛	5	5⅛	4⅞
1932	4¾	5	5	4¾	5	4⅞	4¾	3¾	3¾	3¾	3¾	3⅝
WHITE CLOVER												
F. o. b. New York and North Central States:[4]												
1927	10¼	10	9½	9½	9¼	8¾	8½	9	8½	8½	8¾	8½
1928	8½	8¼	8	8	8	8½	9¼	9	8¾	8½	9	8½
1929	8¾	8¾	9	9¼	8¾	9	9½	8¾	8½	8¼	8¼	8
1930	8¼	8¼	8¼	8¼	8⅛	7¾	7¾	8	7¾	7¼	7⅜	7½
1931	7⅜	6⅞	6¾	6¾	6¾	6⅞	6¾	6¾	6⅝	7	6⅝	6⅜
1932	6½	6¼	6¼	5⅞	6	5¾	6	5⅜	5½	5¼	5	4⅞
NORTHEASTERN BUCKWHEAT												
F. o. b. New York and Pennsylvania points:[4]												
1927	8¼	7	7¼	------	8½	------	------	8	7½	7¼	7¼	7½
1928	7¼	7¼	7¼	6¾	------	------	------	8	7¾	7½	7½	7¼
1929	7¾	7½	7	7¼	7½	7½	------	8½	7⅞	8	7⅝	7¼
1930	7¾	6½	6¾	7⅜	------	7	------	8	6½	6½	5½	6
1931	------	5¾	5⅝	5¾	------	------	5½	------	5	5	5	5
1932	5¼	4¾	4¾	4½	4¾	------	------	4⅝	4½	4⅜	------	4

COMB HONEY, 24-SECTION CASES

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
WHITE CLOVER COMB, NO. 1 AND FANCY												
F. o. b. New York and North Central States:[4]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1927	4.50	5.25	5.25	5.25	------	5.00	5.00	4.75	4.25	4.75	4.50	4.60
1928	4.60	4.60	4.50	4.60	4.50	4.25	4.50	4.50	4.50	4.50	4.60	4.50
1929	4.80	4.50	4.25	4.25	4.50	4.25	4.50	4.50	4.25	4.00	4.00	4.00
1930	4.25	4.00	4.00	4.00	4.25	4.00	4.00	4.25	4.25	4.00	4.00	3.75
1931	3.80	3.75	3.60	3.40	3.25	3.50	3.50	3.60	3.75	3.50	3.50	3.40
1932	3.30	3.25	3.35	3.25	3.30	3.35	3.50	3.15	2.85	2.65	2.70	2.60

Bureau of Agricultural Economics.

[1] Price to beekeepers or other shippers in large lots, mostly less than car lots.
[2] Sales by original receivers to bottlers, confectioners, bakers, and jobbers.
[3] Price to beekeepers and other shippers, in car lots.
[4] Price to beekeepers in large lots, mostly less than car lots.

TABLE 145.—*Tobacco, unmanufactured: Acreage, production, value, exports, etc., United States, 1890–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per pound received by producers Dec. 1	Farm value, basis Dec. 1, farm price	Domestic exports, year beginning July [1]	Imports, year beginning July [1]	Net exports, year beginning July [1] [2]
	Acres	*Lbs.*	*1,000 lbs.*	*Cts.*	*1,000 dolls.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1890	722, 028	722. 8	518, 683	8. 3	42, 846	249, 233	23, 255	227, 254
1891	738, 216	747. 4	551, 777	8. 5	47, 074	255, 432	21, 980	234, 587
1892	720, 189	687. 6	495, 209	9. 3	46, 044	266, 083	28, 110	239, 153
1893	702, 952	687. 1	483, 024	8. 1	39, 155	290, 685	19, 663	272, 983
1894	523, 103	777. 4	406, 678	6. 8	27, 761	300, 992	26, 068	270, 223
1895	633, 950	775. 4	491, 544	7. 2	35, 574	295, 539	32, 925	266, 317
1896	594, 749	677. 6	403, 004	6. 0	24, 258	314, 932	13, 805	302, 847
1897	[3] 945, 604	646. 0	610, 860			263, 020	10, 477	264, 007
1898	[3] 933, 868	748. 0	698, 633			283, 613	14, 036	271, 559
1899	*1, 101, 460*	*788. 1*	*868, 113*					
1899	1, 101, 500	728. 5	802, 397	7. 1	57, 273	344, 656	19, 620	320, 930
1900	1, 046, 427	778. 2	814, 345	6. 6	53, 661	315, 788	26, 851	290, 915
1901	1, 039, 199	788. 0	818, 953	7. 1	58, 283	301, 007	29, 429	273, 770
1902	1, 030, 734	797. 3	821, 824	7. 0	57, 564	368, 184	34, 017	337, 902
1903	1, 037, 735	786. 3	815, 972	6. 8	55, 515	311, 972	31, 163	286, 335
1904	806, 409	819. 0	660, 461	8. 1	53, 383	334, 302	33, 288	304, 604
1905	776, 112	815. 6	633, 034	8. 5	53, 519	312, 227	41, 126	273, 912
1906	796, 099	857. 2	682, 429	10. 0	68, 233	340, 743	40, 890	302, 500
1907	820, 800	850. 5	698, 126	10. 2	71, 411	330, 813	35, 005	297, 657
1908	875, 425	820. 2	718, 061	10. 3	74, 130	287, 901	43, 123	247, 155
1909	*1, 294, 911*	*815. 3*	*1, 055, 765*					
1909	1, 294, 900	814. 8	1, 055, 133	10. 1	106, 374	357, 196	46, 838	313, 085
1910	1, 366, 100	807. 7	1, 103, 415	9. 3	102, 142	355, 327	48, 203	309, 171
1911	1, 013, 000	893. 7	905, 109	9. 4	85, 210	379, 845	54, 740	327, 199
1912	1, 226, 000	785. 5	962, 855	10. 8	104, 063	418, 797	67, 977	358, 575
1913	1, 216, 100	784. 3	953, 734	12. 8	122, 481	449, 750	61, 175	391, 196
1914	1, 223, 500	845. 7	1, 034, 679	9. 8	101, 411	348, 346	45, 809	306, 420
1915	1, 369, 900	775. 4	1, 062, 237	9. 1	96, 281	443, 293	48, 078	400, 624
1916	1, 413, 400	816. 0	1, 153, 278	14. 7	169, 672	411, 599	49, 105	370, 987
1917	1, 517, 800	823. 1	1, 249, 276	24. 0	300, 449	289, 171	86, 091	211, 962
1918	1, 647, 100	873. 7	1, 430, 071	28. 0	402, 264	629, 288	83, 951	577, 323
1919	*1, 861, 480*	*736. 8*	*1, 371, 504*					
1919	1, 958, 500	737. 4	1, 444, 206	[4] 31. 2	[5] 451, 171	648, 038	94, 005	570, 858
1920	1, 934, 800	780. 0	1, 509, 212	[4] 17. 3	[5] 260, 350	506, 526	58, 923	456, 477
1921	1, 339, 500	750. 2	1, 004, 928	[4] 19. 5	[5] 196, 113	463, 389	65, 225	403, 492
1922	1, 616, 200	776. 1	1, 254, 304	[4] 22. 8	[5] 286, 417	454, 364	75, 788	384, 223
1923	1, 855, 000	818. 1	1, 517, 583	[4] 19. 0	[5] 288, 102	597, 630	54, 407	548, 287
1924	*1, 537, 843*	*719. 4*	*1, 106, 340*					
1924	1, 702, 300	731. 3	1, 244, 928	[4] 19. 0	[5] 236, 937	430, 702	76, 870	355, 739
1925	1, 750, 700	786. 0	1, 376, 008	[4] 16. 8	[5] 230, 642	537, 240	69, 974	468, 958
1926	1, 628, 400	791. 7	1, 289, 272	[4] 17. 9	[5] 231, 208	516, 402	92, 983	424, 651
1927	1, 555, 900	778. 5	1, 211, 311	[4] 20. 7	[5] 250, 462	489, 996	81, 045	411, 366
1928	1, 864, 400	736. 5	1, 373, 214	[4] 20. 0	[5] 274, 620	565, 925	79, 284	489, 149
1929	*1, 888, 365*	*771. 3*	*1, 456, 510*					
1929	1, 987, 600	773. 5	1, 537, 313	[4] 18. 6	[5] 286, 152	600, 181	63, 181	541, 312
1930	2, 111, 600	780. 2	1, 647, 377	[4] 12. 9	[5] 212, 467	591, 035	75, 425	517, 388
1931	2, 015, 500	795. 9	1, 604, 226	[4] 8. 2	[5] 131, 830	432, 360	73, 375	359, 373
1932 [6]	1, 432, 700	721. 2	1, 033, 330	[4] 10. 7	[5] 110, 910			

Bureau of Agricultural Economics. Italic figures are census returns; other acreage, yield, and production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text. See p. 970, 1927 Yearbook, for data for earlier years.

[1] Compiled from Commerce and Navigation of the United States, 1890–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues 1919–1926, January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.

[2] Total exports (domestic exports plus foreign) minus imports.

[3] Revised on basis of 1899.

[4] Weighted average price for crop marketing season.

[5] Based on weighted average price for crop marketing season.

[6] *Preliminary.*

TABLE 146.—*Tobacco: Acreage, yield, production, and weighted average price, by types, 1931 and 1932*

Class and type	Type No.	Acreage harvested		Yield per acre		Production		Weighted average price per pound, crop marketing season	
		1931	*1932* [1]	*1931*	*1932*	*1931*	*1932* [1]	*1931*	*1932*
Flue cured:		*Acres*	*Acres*	*Pounds*	*Pounds*	*1,000 lbs.*	*1,000 lbs.*	*Cts.*	*Cts.*
Old Belt	11	368, 500	232, 500	643	543	236, 844	126, 147	7. 7	10. 4
Eastern North Carolina Belt	12	365, 000	254, 000	690	600	251, 850	152, 400	9. 0	12. 3
South Carolina Belt	13	158, 500	112, 000	714	630	113, 194	70, 596	10. 1	12. 5
Georgia-Florida Belt	14	89, 000	28, 500	709	451	63, 079	12, 861	6. 4	10. 5
Total flue cured	11–14	981, 000	627, 000	678	577	664, 967	362, 004	8. 5	11. 6
Fire cured:									
Virginia	21	39, 000	23, 400	725	626	28, 275	14, 648	4. 9	8. 6
Clarksville - Hopkinsville	22	125, 000	97, 000	810	810	101, 290	78, 590	5. 8	6. 5
Paducah	23	64, 300	36, 400	838	820	53, 892	29, 848	4. 0	4. 6
Henderson Stemming	24	8, 700	5, 500	840	835	7, 308	4, 593	4. 0	3. 7
Total fire cured	21–24	237, 000	162, 300	805	787	190, 765	127, 679	5. 1	6. 2
Air cured (light):									
Burley	31	517, 800	432, 000	877	797	454, 159	344, 197	8. 7	12. 7
Southern Maryland	32	38, 200	32, 500	775	700	29, 605	22, 750	15. 0	16. 0
Total air cured (light)	31–32	556, 000	464, 500	870	790	483, 764	366, 947	9. 1	12. 9
Air cured (dark):									
One Sucker	35	35, 200	22, 600	848	802	29, 844	18, 130	3. 5	4. 8
Green River	36	48, 200	27, 000	890	810	42, 898	21, 870	3. 3	3. 4
Virginia sun cured	37	5, 000	3, 500	625	560	3, 125	1, 960	5. 8	6. 5
Total air cured (dark)	35–37	88, 400	53, 100	858	790	75, 867	41, 960	3. 5	4. 2
Cigar filler:									
Pennsylvania seed leaf	41	40, 500	41, 700	1, 411	1, 030	57, 137	42, 951	7. 4	7. 0
Miami Valley	42–44	33, 200	29, 700	1, 009	730	33, 490	21, 690	5. 3	5. 0
Georgia-Florida sun grown	45	1, 200	300	882	633	1, 058	190	15. 0	10. 0
Total cigar filler	41–45	74, 900	71, 700	1, 224	904	91, 685	64, 831	6. 7	6. 3
Cigar binder:									
Connecticut Valley broadleaf	51	13, 200	6, 600	1, 414	1, 519	18, 662	10, 026	14. 1	10. 0
Connecticut Valley Havana seed	52	11, 100	9, 200	1, 385	1, 490	15, 378	13, 713	13. 0	11. 0
New York and Pennsylvania Havana seed	53	1, 600	1, 800	1, 308	1, 007	2, 092	1, 812	9. 5	8. 6
Southern Wisconsin	54	24, 000	19, 200	1, 290	1, 300	30, 960	24, 956	5. 6	3. 6
Northern Wisconsin	55	17, 900	9, 400	1, 119	1, 264	20, 025	11, 880	5. 1	3. 9
Total cigar binder	51–55	67, 800	46, 200	1, 285	1, 350	87, 117	62, 387	8. 7	6. 5
Cigar wrapper:									
Connecticut Valley shade grown	61	5, 800	4, 500	913	981	5, 295	4, 414	75. 0	65. 0
Georgia-Florida shade grown	62	2, 900	2, 400	1, 069	1, 005	3, 101	2, 411	50. 0	35. 0
Total cigar wrapper	61–62	8, 700	6, 900	965	989	8, 396	6, 825	65. 8	54. 4
Miscellaneous types:									
Eastern Ohio		1, 200	600	1, 200	875	1, 440	525	6. 4	11. 5
Louisiana Perique		500	400	450	430	225	172	26. 0	25. 0
Total miscellaneous types		1, 700	1, 000	979	697	1, 665	697	9. 0	14. 8
United States	All	2, 015, 500	1, 432, 700	795. 9	721. 2	1, 604, 226	1, 033, 330	8. 2	10. 7

Bureau of Agricultural Economies. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 147.—*Tobacco: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Weighted average price per pound, crop marketing season	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	Acres	*Acres*	*Acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*Cents*	*Cents*
Massachusetts	8,600	7,600	5,600	1,346	1,327	1,410	11,320	10,085	7,896	19.2	16.4
Connecticut	26,100	22,500	14,700	1,329	1,300	1,378	33,892	29,250	20,257	22.8	20.2
New York	1,320	1,200	1,400	1,175	1,300	1,000	1,529	1,560	1,400	9.5	8.6
Pennsylvania	38,800	40,900	42,100	1,339	1,410	1,030	51,840	57,669	43,363	7.4	7.0
Ohio	42,240	55,000	45,000	861	993	732	34,361	54,615	32,940	6.5	7.6
Indiana	15,480	21,100	13,700	865	915	768	13,292	19,306	10,522	6.5	10.3
Wisconsin	33,400	40,000	28,000	1,186	1,220	1,292	38,868	48,800	36,176	5.4	3.7
Minnesota	700	1,900	600	[2] 1,100	1,150	1,100	782	2,185	660	5.5	3.0
Missouri	4,280	7,500	7,000	958	950	1,025	4,090	7,125	7,175	10.1	12.0
Maryland	31,200	38,200	32,500	773	775	700	24,369	29,605	22,750	15.0	16.0
Virginia	194,200	153,000	95,000	644	640	597	126,860	97,920	56,715	6.6	9.1
West Virginia	6,400	7,000	3,500	770	740	600	4,868	5,180	2,100	9.3	14.3
North Carolina	585,000	698,000	476,000	665	687	590	403,133	479,526	280,840	8.8	12.0
South Carolina	104,800	102,000	68,000	674	686	577	68,328	69,972	39,236	9.2	12.5
Georgia	68,700	84,000	27,000	688	710	463	52,632	59,640	12,501	6.8	11.3
Florida	7,720	9,100	4,200	951	835	705	6,641	7,598	2,961	22.2	27.0
Kentucky	413,800	565,000	433,000	802	865	797	330,574	488,725	345,101	7.1	10.3
Tennessee	117,200	161,000	135,000	783	840	819	91,399	135,240	110,565	7.4	10.0
Louisiana	400	500	400	432	450	430	169	225	172	26.0	25.0
United States	1,700,340	2,015,500	1,432,700	768.6	795.9	721.2	1,298,947	1,604,226	1,033,330	8.2	10.7

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary. [2] 5-year average.

TABLE 148.—*Tobacco: Acreage, yield per acre, and production in specified countries, annual 1930–31 to 1932–33* [1]

Country	Acreage			Yield per acre [2]			Production		
	1930–31	*1931–32*	*1932–33* [3]	*1930–31*	*1931–32*	*1932–33*	*1930–31*	*1931–32*	*1932–33* [3]
NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Canada	41	55	54	886	932	990	36,717	51,300	54,094
United States	2,112	2,016	1,433	780	796	721	1,647,377	1,604,226	1,033,330
Mexico	33	35		699	720		23,130	25,184	
Cuba							82,118	80,707	34,093
Dominican Republic							24,030		[4] 11,574
Puerto Rico	46	[4] 50		600	670		27,413	[4] 33,500	
EUROPE									
Sweden	1	1		1,867	1,409		1,351	961	
Belgium	7	7	7	2,113	2,066	2,052	15,387	14,469	13,519
Germany	23	26	27	2,025	1,951	1,918	46,408	51,104	51,257
Poland	12	13	13	1,078	1,090	1,499	13,080	14,550	19,305
Russia	248	[4] 378	[4] 667	1,229	747	1,044	305,183	[4] 282,240	[4] 696,640
France	38	31	41	1,820	1,542	1,690	69,163	47,619	70,106
Switzerland	1	1		1,785	1,427		1,323	882	
Czechoslovakia	19	22	25	1,192	1,363	1,323	22,095	30,495	33,069
Hungary	59	62	61	1,271	1,303	1,395	75,397	80,468	84,877
Rumania	85	40	25	623	625	695	53,011	24,926	17,637
Spain	12	9	12	1,481	1,443	1,102	17,415	12,991	13,228

See footnotes at end of table.

TABLE 148.—*Tobacco: Acreage, yield per acre, and production in specified countries, annual 1930–31 to 1932–33*—Continued

Country	Acreage			Yield per acre [2]			Production		
	1930–31	1931–32	1932–33 [3]	1930–31	1931–32	1932–33	1930–31	1931–32	1932–33 [3]
EUROPE—continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Italy	108	103	99	1,193	1,000	906	128,606	103,031	95,593
Yugoslavia	41	53	--------	848	753	--------	34,877	39,683	--------
Bulgaria	78	77	47	678	711	666	52,825	54,784	31,306
Greece	239	211	171	608	429	350	145,215	90,380	59,982
ASIA									
Turkey [5]	161	--------	--------	573	--------	--------	92,184	88,184	50,706
Syria and Lebanon	10	19	11	696	614	387	6,967	11,671	4,255
Palestine	2	1	--------	978	784	--------	2,112	972	--------
Iraq	14	--------	--------	1,054	--------	--------	14,560	--------	--------
India	1,257	--------	--------	[6] 1,029	--------	--------	[6] 1,281,280	--------	--------
Ceylon	14	14	--------	--------	--------	--------	--------	--------	--------
Siam	22	22	--------	481	709	--------	10,533	15,858	--------
Indo-China	--------	--------	--------	--------	--------	--------	27,778	--------	--------
Japan	89	90	84	1,631	1,731	1,646	145,175	155,757	138,230
Chosen (Korea)	35	37	--------	955	1,010	--------	33,291	37,709	--------
Taiwan (Formosa)	2	--------	--------	1,637	--------	--------	3,316	--------	--------
Philippine Islands	198	184	--------	514	522	--------	101,662	95,930	--------
Java and Madura [7]	80	86	--------	828	825	--------	66,290	71,115	--------
Sumatra	--------	--------	--------	--------	--------	--------	[4] 37,160	[4] 32,115	[4] 26,928
SOUTH AMERICA									
Brazil	--------	--------	--------	--------	--------	--------	[4] 187,351	--------	--------
Chile	--------	14	--------	--------	1,378	--------	16,701	18,914	--------
Argentina	31	31	--------	--------	940	--------	--------	28,953	--------
Paraguay	--------	--------	--------	--------	--------	--------	[4] 29,762	--------	--------
Uruguay	1	--------	--------	965	--------	--------	1,216	--------	--------
AFRICA									
Algeria	57	57	52	762	699	763	43,749	39,863	39,683
Tunis	1	--------	--------	835	--------	--------	1,088	--------	--------
Tripolitania	1	1	--------	1,543	1,323	--------	1,543	1,323	--------
Tanganyika	--------	6	--------	--------	382	--------	--------	2,316	--------
Nyasaland	43	[7] 13	--------	372	[7] 309	--------	15,990	14,291	[7] 12,000
Northern Rhodesia	--------	--------	--------	--------	--------	--------	892	900	--------
Southern Rhodesia	16	26	35	535	548	580	8,644	14,430	20,220
Union of South Africa	--------	--------	--------	--------	--------	--------	16,484	19,600	--------
Madagascar	32	22	--------	579	802	--------	18,519	17,637	--------
OCEANIA									
Australia	4	20	--------	532	538	--------	1,950	10,880	--------
Total, all countries reporting acreage or production all years	3,253	3,242	2,864	--------	--------	--------	3,059,866	2,899,601	2,600,658
Estimated world total [8]	--------	--------	--------	--------	--------	--------	5,112,000	--------	--------

Bureau of Agricultural Economics. Compiled from official sources, International Institute of Agriculture, and reports of United States consuls, commercial attachés, agricultural attachés, and commodity specialists in foreign countries, except as otherwise stated.

[1] Acreage and production figures are for the harvesting season. In the Northern Hemisphere data for 1930–31, for example, are for crops harvested in the summer and fall of 1930; in the Southern Hemisphere they are for crops harvested in the spring of 1931, except in the Dutch East Indies, where the harvest was largely completed in 1930.

[2] Calculated from actual acreage and production, except in instances where rounded figures, only, were available.

[3] Preliminary.

[4] Unofficial.

[5] Turkey in Europe and in Asia.

[6] Exclusive of North-West Frontier Province.

[7] Data for European plantations only.

[8] Exclusive of China for which complete data are not available. The production of flue-cured tobacco, alone, which represents only a small proportion of the total of China was estimated at 82,000,000 pounds in 1931–32 and 80,000,000 pounds in 1932–33.

TABLE 149.—*Tobacco, unmanufactured: Production, stocks, supply, disappearance, and price, 1927–1932* [1]

FLUE-CURED, TYPES 11-14

Year	Production [2]	Stocks on hand July 1	Total supply	Disappearance, year beginning July 1 [2]	Average price per pound	Year	Production [2]	Stocks on hand July 1	Total supply	Disappearance, year beginning July 1 [2]	Average price per pound
	Million pounds	Million pounds	Million pounds	Million pounds	Cents		Million pounds	Million pounds	Million pounds	Million pounds	Cents
1927	718.8	466.5	1,185.3	620.3	20.5	1930	864.3	599.3	1,463.6	786.8	12.0
1928	739.1	565.0	1,304.1	714.1	17.3	1931	665.0	676.8	1,341.8	596.6	8.5
1929	749.8	590.0	1,339.8	740.5	18.0	1932	[3] 362.0	745.2	1,107.2	....	[3] 11.6

VIRGINIA FIRE-CURED, TYPE 21

Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound	Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound
	Million pounds	Million pounds	Million pounds	Million pounds	Cents		Million pounds	Million pounds	Million pounds	Million pounds	Cents
1927	26.6	56.1	82.7	33.7	9.9	1930	23.3	27.9	51.2	22.6	8.3
1928	21.9	49.0	70.9	39.6	10.6	1931	28.3	28.6	56.9	24.7	4.9
1929	22.8	31.3	54.1	26.2	16.9	1932	[3] 14.6	32.2	46.8	....	[3] 8.0

KENTUCKY AND TENNESSEE FIRE-CURED, TYPES 22 AND 23

Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound		Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound	
					Clarksville and Hopkinsville	Paducah						Clarksville and Hopkinsville	Paducah
	Million pounds	Million pounds	Million pounds	Million pounds	Cents	Cents		Million pounds	Million pounds	Million pounds	Million pounds	Cents	Cents
1927	82.7	161.9	244.6	130.5	18.4	12.2	1930	134.1	107.1	241.2	111.9	9.9	5.6
1928	108.6	114.1	222.7	118.6	15.8	12.6	1931	155.2	129.3	284.5	126.0	6.8	4.0
1929	155.0	104.1	259.1	152.0	14.2	10.0	1932	[3] 108.4	158.5	266.9	....	[3] 6.5	[3] 4.6

HENDERSON FIRE-CURED, TYPE 24

Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound	Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound
	Million pounds	Million pounds	Million pounds	Million pounds	Cents		Million pounds	Million pounds	Million pounds	Million pounds	Cents
1927	4.2	7.2	11.4	6.8	9.7	1930	8.9	0.7	9.6	6.5	6.9
1928	6.0	4.6	10.6	9.9	13.9	1931	7.3	3.1	10.4	6.3	4.0
1929	9.5	.7	10.2	9.5	9.5	1932	84.6	4.1	8.7	....	[3] 3.7

[1] Production and price data, 1927–1929, revised May, 1932. Revised data for years 1919–1926 published in U. S. Department of Agriculture Circular No. 249.

[2] Green-weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports, and losses.

[3] Preliminary.

TABLE 149.—*Tobacco, unmanufactured: Production, stocks, supply, disappearance, and price, 1927–1932*—Continued

BURLEY, TYPE 31

Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound	Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Cents*		*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Cents*
1927	176.2	451.3	627.5	279.7	25.9	1930	357.7	373.0	730.7	293.9	15.5
1928	269.1	347.8	616.9	284.5	30.5	1931	454.2	436.8	891.0	305.1	8.7
1929	342.2	332.4	674.6	301.6	21.8	1932	[3] 344.2	585.9	930.1	--------	[3] 12.7

SOUTHERN MARYLAND, TYPE 32

1927	26.2	21.9	48.1	23.0	23.4	1930	18.7	17.2	35.9	13.8	26.6
1928	20.5	25.1	45.6	26.6	27.2	1931	29.6	22.1	51.7	21.0	15.0
1929	24.8	19.0	43.8	26.6	27.7	1932	[3] 22.8	30.7	53.5	--------	[3] 16.0

ONE SUCKER, TYPE 35

1927	13.1	41.7	54.8	27.9	10.6	1930	29.4	25.1	54.5	22.2	7.0
1928	20.0	26.9	46.9	25.5	12.4	1931	29.8	32.3	62.1	28.4	3.5
1929	29.9	21.4	51.3	26.2	10.5	1932	[3] 18.1	33.7	51.8	--------	[3] 4.8

GREEN RIVER, TYPE 36

1927	18.1	48.4	66.5	26.4	9.1	1930	28.3	23.8	52.1	27.9	8.9
1928	18.9	40.1	59.0	28.2	11.5	1931	42.9	24.2	67.1	30.8	3.3
1929	27.4	30.8	58.2	34.4	10.7	1932	[3] 21.9	36.3	58.2	--------	[3] 3.4

VIRGINIA SUN-CURED, TYPE 37

1927	5.5	5.9	11.4	6.3	13.1	1930	3.4	3.9	7.3	3.8	7.7
1928	5.0	5.1	10.1	4.6	10.1	1931	3.1	3.5	6.6	3.2	5.8
1929	4.1	5.5	9.6	5.7	13.2	1932	[3] 2.0	3.4	5.4	--------	[3] 6.5

PENNSYLVANIA CIGAR LEAF, TYPE 41

1927	46.6	84.1	130.7	46.1	12.9	1930	39.4	79.6	119.0	44.8	6.4
1928	50.7	84.6	135.3	52.0	13.9	1931	57.1	74.2	131.3	23.7	7.4
1929	50.8	83.3	134.1	54.5	12.0	1932	[3] 43.0	107.6	150.6	--------	[3] 7.0

MIAMI VALLEY, TYPES 42–44

1927	12.2	56.8	69.0	22.1	15.6	1930	32.3	36.4	68.7	14.5	10.1
1928	15.6	46.9	62.5	22.6	17.5	1931	33.5	54.2	87.7	29.9	5.3
1929	20.7	39.9	60.6	24.2	13.8	1932	[3] 21.7	57.8	79.5	--------	[3] 5.0

GEORGIA AND FLORIDA SUN- AND SHADE-GROWN, TYPES 45 AND 62

1927	5.2	4.9	10.1	3.0	49.4	1930	5.3	8.3	13.6	6.0	48.7
1928	5.5	7.1	12.6	5.7	44.9	1931	4.2	7.6	11.8	4.6	41.1
1929	6.2	6.9	13.1	4.8	44.6	1932	[3] 2.6	7.2	9.8	--------	[3] 33.2

[2] Green-weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports and losses.
[3] Preliminary.

TABLE 149.—*Tobacco, unmanufactured: Production, stocks, supply, disappearance, and price, 1927–1932*—Continued

Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound	Year	Production [2]	Stocks on hand Oct. 1	Total supply	Disappearance, year beginning Oct. 1 [2]	Average price per pound
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Cents*		*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Cents*
NEW ENGLAND BROADLEAF, TYPE 51											
1927	17.0	37.7	54.7	23.3	21.0	1930	18.5	24.8	43.3	13.3	25.1
1928	16.1	31.4	47.5	16.5	21.0	1931	18.7	30.0	48.7	12.1	14.1
1929	12.1	31.0	43.1	18.3	27.4	1932	[3] 10.0	36.6	46.6	....	[3] 11.0
NEW ENGLAND HAVANA SEED, TYPE 52											
1927	15.1	42.4	57.5	20.6	23.5	1930	17.9	32.9	50.8	17.4	21.9
1928	16.5	36.9	53.4	22.0	24.0	1931	15.4	33.4	48.8	11.7	13.0
1929	17.8	31.4	49.2	16.3	31.1	1932	[3] 13.7	37.1	50.8	....	[3] 11.0
NEW YORK AND PENNSYLVANIA HAVANA SEED, TYPE 53											
1927	1.9	3.2	5.1	2.8	18.0	1930	1.5	2.2	3.7	0.7	11.7
1928	1.6	2.3	3.9	1.7	19.3	1931	2.1	3.0	5.1	1.2	9.5
1929	1.4	2.2	3.6	1.4	15.4	1932	[3] 1.8	3.9	5.7	....	[3] 8.6
WISCONSIN CIGAR LEAF, TYPES 54 AND 55											
1927	33.9	83.1	117.0	44.5	16.0	1930	55.8	85.3	141.1	35.9	10.0
1928	49.3	72.5	121.8	35.1	14.6	1931	51.0	105.2	156.2	34.9	5.4
1929	49.9	86.7	136.6	51.3	15.0	1932	[3] 36.8	121.3	158.1	....	[3] 3.7
NEW ENGLAND SHADE-GROWN, TYPE 61											
1927	6.4	6.5	12.9	6.1	105.0	1930	7.7	10.2	17.9	7.0	90.0
1928	6.9	6.8	13.7	7.2	100.0	1931	5.3	10.9	16.2	5.3	75.0
1929	10.2	6.5	16.7	6.5	95.0	1932	[3] 4.4	10.9	15.3	....	[3] 65.0

Bureau of Agricultural Economics. Stocks prior to 1929 compiled from reports of the Bureau of the Census.

[2] Green-weight basis, i. e., farmers' sales weight. Disappearance includes consumption, exports, and losses.

[3] Preliminary.

TABLE 150.—*Tobacco: Stocks in hands of dealers and manufacturers, first of each quarter, 1928–1932*

Type and year	Jan. 1	Apr. 1	July 1	Oct. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Flue-cured, types 11, 12, 13, and 14:				
1928	756, 535	678, 958	564, 989	661, 817
1929	766, 370	703, 396	589, 978	669, 070
1930	795, 484	707, 149	599, 262	687, 769
1931	868, 983	831, 347	676, 752	739, 356
1932	893, 098	845, 642	795, 207	720, 508
Virginia fire-cured, type 21:				
1928	57, 000	64, 931	59, 409	49, 040
1929	47, 633	49, 092	38, 216	31, 268
1930	34, 997	40, 021	35, 625	27, 917
1931	33, 392	38, 364	33, 241	28, 807
1932	30, 352	40, 711	36, 243	32, 216
Kentucky and Tennessee fire-cured, types 22 and 23:				
1928	150, 328	168, 012	143, 883	114, 120
1929	105, 902	140, 420	133, 719	104, 131
1930	106, 860	158, 623	146, 855	107, 056
1931	100, 551	154, 404	155, 546	129, 349
1932	111, 856	155, 479	176, 979	158, 506
Henderson fire-cured (stemming), type 24:				
1928	7, 694	8, 390	5, 314	4, 583
1929	3, 446	2, 859	1, 288	711
1930	2, 794	5, 089	2, 291	736
1931	3, 788	8, 519	4, 212	3, 102
1932	3, 183	5, 234	5, 186	4, 147
Burley, type 31:				
1928	438, 267	475, 508	411, 095	347, 827
1929	354, 772	465, 941	396, 541	332, 382
1930	352, 803	506, 378	438, 659	373, 032
1931	407, 557	568, 010	500, 042	436, 802
1932	490, 614	702, 834	651, 166	585, 903
Southern Maryland, type 32:				
1928	15, 314	10, 848	12, 104	25, 132
1929	20, 245	13, 134	13, 293	18, 982
1930	15, 304	11, 960	9, 553	17, 167
1931	17, 038	14, 615	11, 756	22, 109
1932	20, 998	19, 559	21, 677	30, 670
One-sucker, type 35:				
1928	38, 813	39, 815	32, 399	26, 882
1929	28, 067	37, 666	26, 496	21, 374
1930	29, 852	38, 218	30, 283	25, 123
1931	29, 180	48, 357	41, 026	32, 324
1932	31, 680	45, 106	37, 495	33, 710
Green River, type 36:				
1928	47, 878	49, 127	43, 722	40, 127
1929	41, 122	35, 968	35, 670	30, 756
1930	30, 824	35, 618	28, 533	23, 786
1931	27, 369	29, 308	26, 136	24, 242
1932	26, 953	38, 957	36, 952	36, 305
Virginia sun-cured, type 37:				
1928	6, 504	7, 558	6, 347	5, 052
1929	4, 422	7, 915	6, 073	5, 492
1930	4, 941	5, 820	4, 935	3, 878
1931	3, 855	4, 709	4, 142	3, 455
1932	3, 174	4, 635	4, 207	3, 358
Pennsylvania cigar leaf, types 41 and 53:				
1928	71, 516	106, 646	95, 466	84, 649
1929	72, 424	------	------	------
Pennsylvania seedleaf, type 41:				
1929	------	111, 639	93, 861	83, 306
1930	73, 186	93, 795	90, 292	79, 592
1931	68, 790	80, 387	83, 011	74, 200
1932	66, 310	115, 064	114, 702	107, 642

Type and year	Jan. 1	Apr. 1	July 1	Oct. 1
Ohio cigar leaf (Miami Valley), types 42, 43, and 44:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1928	48, 420	60, 696	55, 515	46, 875
1929	38, 868	55, 392	47, 094	39, 888
1930	34, 502	41, 448	42, 282	36, 427
1931	30, 502	54, 389	58, 455	54, 181
1932	48, 572	55, 605	61, 424	57, 762
Georgia-Florida cigar leaf, sun and shade types 45 and 62:				
1928	4, 461	4, 019	2, 618	7, 081
1929	5, 994	------	------	------
Georgia and Florida sun-grown, type 45:				
1929	------	1, 174	803	2, 078
1930	1, 538	1, 319	1, 340	2, 345
1931	2, 033	2, 223	1, 530	2, 419
1932	2, 097	2, 188	2, 277	2, 025
Puerto Rico cigar leaf, type 46:				
1928	21, 426	23, 646	21, 172	20, 067
1929	22, 230	26, 128	25, 142	25, 270
1930	29, 039	28, 442	24, 734	23, 510
1931	27, 284	27, 932	24, 940	23, 546
1932	26, 415	25, 647	23, 470	20, 336
New England broad leaf, type 51:				
1928	32, 827	38, 915	32, 205	31, 441
1929	28, 102	37, 880	34, 458	31, 016
1930	29, 507	30, 072	28, 960	24, 809
1931	23, 438	30, 758	33, 377	29, 969
1932	29, 501	36, 505	36, 783	36, 617
New England Havana seed, type 52:				
1928	40, 889	45, 376	46, 066	36, 905
1929	38, 076	39, 946	35, 558	31, 388
1930	33, 487	43, 468	35, 732	32, 898
1931	32, 739	42, 176	38, 265	33, 442
1932	33, 849	41, 753	40, 854	37, 076
New York Havana seed, type 53:				
1928	2, 673	2, 601	2, 608	2, 279
1929	2, 054	3, 342	2, 781	2, 200
1930	2, 395	2, 811	2, 533	2, 166
1931	2, 837	3, 558	3, 644	3, 034
1932	2, 864	4, 455	4, 370	3, 881
Wisconsin cigar leaf, types 54 and 55:				
1928	69, 925	94, 135	84, 924	72, 543
1929	62, 359	97, 345	97, 380	86, 701
1930	72, 614	101, 420	97, 023	85, 274
1931	73, 291	97, 515	112, 555	105, 169
1932	95, 964	114, 686	128, 423	121, 273
New England shade-grown, type 61:				
1928	8, 363	7, 878	5, 878	6, 815
1929	8, 722	8, 749	5, 954	6, 476
1930	11, 329	10, 499	10, 207	10, 162
1931	11, 771	10, 818	10, 255	10, 863
1932	10, 908	11, 504	10, 720	10, 902
Georgia and Florida shade, type 62:				
1929	------	3, 844	3, 564	4, 824
1930	5, 048	4, 950	3, 868	5, 921
1931	5, 165	4, 428	4, 110	5, 197
1932	4, 825	4, 407	3, 616	5, 157
Miscellaneous,[1] eastern Ohio, export:				
1928	1, 501	1, 673	1, 415	985
1929	1, 014	------	------	------
Miscellaneous,[2] domestic, type 70:				
1929	------	5, 928	3, 122	2, 302
1930	1, 989	4, 105	2, 932	2, 918
1931	2, 723	2, 973	2, 843	2, 573
1932	2, 864	2, 927	2, 551	2, 182

Bureau of Agricultural Economics.

[1] Not including small quantities of other miscellaneous, e. g., Louisiana perique.
[2] Includes Eastern Ohio Export and all other tobacco classed as miscellaneous.

TABLE 151.—*Leaf tobacco used in manufacturing cigars, cigarettes, and tobacco and snuff, calendar years 1922–1931* [1]

Year	Cigars		Cigarettes		Tobacco and snuff	Total
	Large	Small	Large	Small		
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1922	149, 363, 275	2, 345, 976	142, 044	169, 455, 096	325, 509, 008	646, 815, 999
1923	157, 837, 176	1, 915, 384	156, 436	200, 238, 245	328, 888, 700	689, 035, 941
1924	151, 353, 058	2, 056, 784	137, 929	217, 562, 385	322, 745, 284	693, 858, 440
1925	147, 530, 700	1, 470, 374	144, 962	244, 170, 315	325, 100, 202	718, 425, 613
1926	151, 049, 170	1, 322, 339	108, 497	267, 475, 086	317, 399, 077	737, 354, 169
1927	151, 049, 265	1, 460, 667	95, 961	290, 368, 023	301, 314, 291	744, 288, 207
1928	149, 093, 168	1, 296, 722	87, 632	310, 070, 927	293, 176, 363	754, 024, 812
1929	150, 878, 378	1, 250, 740	92, 788	346, 450, 363	297, 953, 440	796, 625, 709
1930	136, 749, 916	1, 151, 057	65, 333	347, 849, 455	293, 990, 441	779, 806, 202
1931	126, 611, 200	1, 016, 997	43, 171	329, 919, 304	294, 812, 985	752, 403, 657

Bureau of Internal Revenue.

[1] The quantities given are unstemmed equivalent of all kinds of tobacco used. Stemmed leaf and scraps etc., used in manufacturing have been converted to unstemmed equivalent at the ratio of 3 pounds stemmed, etc., to 4 pounds unstemmed; in respect to leaf used in the manufacture of tobacco and snuff, prior to 1928 no conversion factor was used but in this table all figures are compiled on the conversion basis named.

TABLE 152.—*Production of manufactured tobacco, snuff, cigars, and cigarettes, calendar years 1922–1931* [1]

Year	Plug	Twist	Fine cut	Scrap chewing	Smoking	Snuff	Total
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1922	120, 174, 363	10, 947, 547	6, 892, 417	(1)	243, 355, 372	38, 136, 406	419, 506, 105
1923	120, 798, 439	10, 665, 185	7, 140, 828	(1)	234, 944, 139	39, 228, 284	412, 776, 875
1924	111, 477, 092	9, 001, 542	6, 780, 581	(1)	246, 990, 137	39, 029, 020	414, 178, 378
1925	111, 390, 766	9, 749, 836	7, 151, 246	(1)	247, 739, 899	37, 841, 222	413, 872, 969
1926	109, 766, 342	9, 179, 089	6, 984, 728	(1)	246, 438, 832	38, 226, 725	410, 595, 716
1927	103, 918, 416	7, 988, 281	6, 286, 483	(1)	237, 933, 677	40, 197, 123	396, 323, 980
1928	100, 646, 047	8, 891, 640	5, 186, 304	(1)	231, 134, 105	40, 475, 382	386, 333, 478
1929	96, 744, 046	8, 187, 608	5, 555, 620	(1)	229, 585, 163	41, 127, 453	381, 199, 890
1930	86, 273, 517	7, 623, 716	5, 089, 410	(1)	232, 013, 383	40, 765, 883	371, 765, 909
1931	76, 652, 810	6, 377, 436	4, 170, 255	61, 235, 195	182, 947, 238	39, 854, 345	371, 237, 290

Year	Cigars [2]		Cigarettes	
	Weighing more than 3 pounds per 1,000	Weighing not more than 3 pounds per 1,000	Weighing more than 3 pounds per 1,000	Weighing not more than 3 pounds per 1,000
	Number	*Number*	*Number*	*Number*
1922	6, 722, 354, 177	632, 906, 635	17, 450, 456	55, 763, 022, 618
1923	6, 950, 247, 389	505, 305, 490	18, 065, 858	66, 715, 830, 430
1924	6, 597, 676, 535	530, 714, 332	16, 054, 295	72, 708, 989, 025
1925	6, 463, 193, 108	144, 089, 170	17, 428, 807	82, 247, 100, 347
1926	6, 498, 641, 233	412, 314, 795	13, 239, 765	92, 096, 973, 920
1927	6, 519, 004, 960	439, 419, 390	11, 432, 360	99, 809, 031, 619
1928	6, 373, 181, 751	415, 535, 410	10, 403, 004	108, 705, 505, 650
1929	6, 518, 533, 042	419, 880, 335	9, 952, 480	122, 392, 380, 846
1930	5, 893, 890, 418	383, 069, 980	7, 366, 925	123, 802, 186, 217
1931	5, 347, 921, 293	338, 996, 780	5, 159, 660	117, 064, 214, 494

Bureau of Internal Revenue.

[1] Included under head of "Smoking" prior to 1931.
[2] Cigars produced in and removed for domestic consumption from bonded manufacturing warehouses are not included.

TABLE 153.—*Tobacco, unmanufactured: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	525, 232	78, 243	565, 902	68, 066	579, 704	71, 543	524, 472	74, 452
Dutch East Indies	170, 071	11, 967	161, 289	17, 098	171, 582	13, 782	178, 565	7, 870
Greece	109, 224	[2] 40	110, 351	20	108, 455	----------	94, 895	----------
Brazil	67, 364	3, 869	67, 251	4, 703	80, 949	3, 733	83, 264	2, 251
Bulgaria	57, 616	0	44, 583	0	49, 499	24	54, 205	----------
Philippine Islands	47, 940	674	64, 833	506	50, 279	412	53, 691	790
Cuba	42, 279	0	46, 693	0	58, 791	0	----------	----------
British India	40, 432	16, 192	37, 623	17, 373	38, 835	12, 417	33, 925	8, 620
Dominican Republic	36, 528	0	36, 297	0	28, 594	0	15, 011	0
Algeria	33, 841	10, 374	35, 740	12, 308	25, 932	12, 495	30, 551	9, 304
Paraguay	14, 252	[3] 162	18, 995	----------	6, 601	----------	----------	----------
Hungary	12, 392	7, 393	30, 112	6, 483	23, 229	6, 977	20, 624	6, 597
Russia	9, 873	0	20, 148	0	20, 086	0	6, 389	0
Yugoslavia	4, 994	766	7, 453	650	2, 659	602	6, 490	454
Ceylon	2, 243	70	3, 194	217	1, 294	555	2, 584	----------
Total	*1, 174, 781*	*129, 750*	*1, 250, 464*	*127, 424*	*1, 246, 489*	*122, 540*	*1, 104, 666*	*110, 338*
PRINCIPAL IMPORTING COUNTRIES								
Germany	679	217, 778	916	228, 112	1, 907	234, 658	657	158, 258
United Kingdom	6, 211	202, 589	8, 404	230, 623	8, 336	223, 493	8, 804	185, 997
China	24, 737	104, 548	17, 207	121, 459	15, 859	124, 349	18, 754	165, 609
France	403	92, 321	119	85, 568	1, 483	154, 960	1, 129	111, 876
Netherlands	3, 115	70, 090	2, 471	72, 438	3, 260	70, 504	4, 388	74, 524
Spain	37	53, 921	185	67, 416	0	57, 070	0	65, 419
Belgium	82	45, 005	100	48, 044	364	49, 239	685	49, 720
Czechoslovakia	7	38, 996	1	45, 284	0	21, 966	0	23, 239
Poland	723	33, 809	256	36, 338	227	42, 342	131	22, 432
Austria	2, 111	31, 367	2, 492	28, 819	2, 670	22, 048	2, 349	20, 160
Argentina	417	23, 945	451	25, 448	1, 042	22, 878	599	26, 538
Australia [4]	7	21, 622	0	21, 138	0	20, 284	0	22, 393
Canada	5, 467	17, 058	7, 244	17, 718	5, 372	17, 435	6, 706	14, 323
Egypt	0	16, 639	0	17, 072	0	15, 805	0	13, 688
Italy	7, 333	16, 165	9, 345	16, 530	7, 285	12, 033	9, 301	6, 004
Switzerland	92	13, 166	172	15, 651	456	16, 573	405	16, 692
Japan	2, 952	12, 832	280	15, 261	3, 295	10, 043	1, 766	16, 080
Sweden	166	12, 099	254	17, 061	160	10, 415	182	12, 849
Denmark	2	11, 835	0	12, 523	0	14, 497	0	13, 481
Irish Free State	269	8, 934	108	9, 328	344	12, 462	----------	*11, 323*
Finland	0	7, 094	0	7, 739	0	10, 286	0	4, 407
Norway	0	5, 037	0	5, 533	0	5, 457	0	6, 665
Total	54, 810	1, 056, 850	50, 005	1, 145, 103	52, 150	1, 168, 857	55, 856	1, 050, 677

Bureau of Agricultural Economics, official sources. Tobacco comprises leaf, stems, and trimmings.

[1] Preliminary.
[2] *3-year average.*
[3] 2-year average.
[4] Year ended June 30.

TABLE 154.—*Tobacco, unmanufactured: Exports, by types, 1923–24 to 1931–32*

Year beginning October	Flue-cured, types 11–14 [1]	Virginia fire-cured, type 21	Kentucky and Tennessee fire-cured, types 22, 23, and 24	Burley, type 31	Southern Maryland, [2] type 32	One Sucker, [3] type 35	Green River, [3] type 36	Cigar leaf	Black fat, water bailer, and dark African [4]	Other leaf [5]	Stems, trimmings, and scrap
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
1923–24	266.0	27.4	167.1	7.7	19.2		16.2	1.5		44.9	30.2
1924–25	207.5	25.7	125.3	6.0	13.7		16.8	.7		20.6	8.6
1925–26	324.4	19.3	110.0	5.8	12.3		14.4	.7		19.4	9.4
1926–27	288.7	22.0	128.4	18.1	18.8	4.6	14.2	.6	0.4	9.7	5.9
1927–28	328.9	21.2	84.7	7.1	12.6	3.4	8.1	.6	1.2	5.9	7.4
1928–29	413.9	21.6	76.9	6.2	13.3	2.9	10.0	4.4	4.5	1.7	9.3
1929–30	429.9	18.1	104.5	9.7	7.8	3.2	8.9	4.3	8.2	.2	12.4
1930–31	432.7	11.8	74.1	8.7	10.5	1.8	5.4	3.7	7.6	.1	26.1
1931–32	285.6	13.3	82.4	11.0	8.5	1.0	4.3	.8	10.4	.1	20.9

Bureau of Agricultural Economics. Compiled from reports of the Bureau of Foreign and Domestic Commerce.

[1] Year beginning July.
[2] Includes eastern Ohio.
[3] Prior to Jan. 1, 1927, One Sucker included with Green River.
[4] Prior to Jan. 1, 1927, included with other leaf.
[5] Prior to Jan. 1, 1929, includes a part of exports of other types not reported separately; beginning Jan. 1, 1929, perique only.

STATISTICS OF FRUITS AND VEGETABLES

TABLE 155.—*Almonds: Production and value, California, 1923–1932*

Item	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [1]
Production..short tons..	11,000	8,000	7,500	16,000	12,000	14,000	4,700	13,500	14,800	14,000
Average price per ton, crop-marketing season ....dollars..	260	300	400	300	320	340	480	200	176	165
Farm value, basis average price crop-marketing season.1,000 dolls..	2,860	2,400	3,000	4,800	3,840	4,760	2,256	2,700	2,605	2,310

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 156.—*Apples: Production, car-lot shipments, prices and foreign trade 1919–1932*

Year	Production		Price per bushel received by producers Dec. 1	Car-lot shipments from crop of year shown		Foreign trade, year beginning July [1, 2]						
						Domestic exports				Imports, fresh and dried in terms of fresh	Net exports [3]	
	Total	Commercial		Cars	Equivalent bushels [4]	Fresh	Dried	Dried in terms of fresh	Canned in terms of fresh		Total	Percentage of production
	1,000 bush.	*1,000 bush.*	*Dolls.*	*Number*	*1,000 bush.*	*1,000 bush.*	*1,000 pounds*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*P. ct.*
1919	*156,561*											
1919	142,086	78,477	1.84			3,152	11,819	1,231		849	3,534	2.5
1920	223,677	101,715	1.15	116,117	69,670	7,995	18,053	1,881		142	9,734	4.4
1921	99,002	64,671	1.68	89,559	53,735	3,282	12,431	1,295		1,353	3,224	3.3
1922	202,702	95,835	.99	113,961	68,377	5,269	12,817	1,335		189	6,415	3.2
1923	202,842	107,808	1.02	138,184	84,405	12,295	30,410	3,168		132	15,331	7.6
1924	*152,967*											
1924	171,725	84,039	1.18	103,843	61,763	9,604	19,225	2,002	562	106	12,062	7.0
1925	172,389	99,738	1.26	127,804	77,885	11,015	24,833	2,587	538	74	14,066	8.2
1926	246,609	117,384	.74	133,550	80,800	21,293	32,670	3,403	675	84	25,287	10.3
1927	123,693	78,051	1.39	93,094	58,375	9,430	21,704	2,261	573	164	12,110	9.8
1928	186,893	106,383	.99	127,530	80,151	21,043	50,024	5,221	1,151	117	27,298	14.6
1929	*186,433*											
1929	133,347	86,604	[5] 1.39	102,801	63,974	10,279	23,769	2,476	836	309	13,282	10.0
1930	153,324	100,587	[5] 1.02	109,794	71,475	20,341	38,120	3,971	640	103	24,849	16.2
1931	202,415	103,776	[5] .65	101,711	63,059	18,031	31,557	3,287	695	82	21,931	10.8
1932 [6]	[7] 139,156	84,819	[5] .59	[8] 77,965	49,958							

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board; italic figures are census returns. Prices to producers are based upon returns from crop reporters. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932; and official records of the Bureau of Foreign and Domestic Commerce.

[2] Dried and canned are converted to terms of fresh apples on following bases: 1 pound of dried is equivalent to about 5 pounds fresh; 1 pound of canned is equivalent to about 2 pounds fresh; 48 pounds fresh equal 1 bushel.

[3] Total exports (domestic plus foreign) minus imports.

[4] For years 1920–1922, it is assumed that the car lots averaged 600 bushels per car. For years 1923 to 1932, inclusive, the estimates of bushels shipped have been calculated according to estimated loadings in each State.

[5] Weighted average price for crop marketing season.

[6] Preliminary.

[7] Includes 220,000 bushels not harvested on account of market conditions.

[8] December forecast of total shipments from 1932 crop.

TABLE 157.—*Apples: Production and weighted average price, by States, average 1924–1928 and annual 1931 and 1932*

State and division	Total			Commercial [1]			Weighted average price per bushel, crop-marketing season	
	Average, 1924–1928	1931	1932 [2]	Average, 1924–1928	1931	1932 [2]	1931	1932
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*
Maine	2,488	1,179	2,412	1,498	690	1,290	0.87	0.61
New Hampshire	1,206	520	936	731	348	660	1.03	.72
Vermont	836	800	1,050	471	498	705	1.10	.78
Massachusetts	3,168	1,575	3,442	1,991	1,098	2,430	1.20	.69
Rhode Island	297	270	375	179	189	246	1.24	.72
Connecticut	1,460	615	1,386	820	402	957	1.28	.83
New York	26,075	17,902	22,197	13,763	11,700	13,650	.82	.54
New Jersey	3,151	3,400	3,640	2,112	2,130	2,352	.96	.83
Pennsylvania	9,372	14,000	9,537	3,288	5,514	3,750	.62	.58
North Atlantic	48,054	40,261	44,975	24,853	22,569	26,058	.80	.61
Ohio	7,206	14,600	5,145	2,081	4,056	1,524	.50	.62
Indiana	2,420	3,600	871	541	900	234	.62	.77
Illinois	6,860	8,265	2,300	3,357	5,400	1,590	.60	.75
Michigan	6,747	10,070	5,590	3,525	5,100	3,057	.54	.62
Wisconsin	1,600	1,827	1,914	395	390	396	.86	.61
Minnesota	1,003	1,180	660	125	114	66	.86	.81
Iowa	2,662	1,620	1,827	326	255	321	.93	.71
Missouri	3,780	5,412	928	1,570	2,250	576	.69	.87
North Dakota	-----	-----	-----	-----	-----	-----	-----	-----
South Dakota	162	11	192	-----	-----	-----	1.41	.81
Nebraska	694	500	627	241	273	285	.95	.62
Kansas	1,595	1,910	546	941	1,290	360	.85	.93
North Central	34,929	48,995	20,600	13,101	20,028	8,409	.61	.68
Delaware	1,527	1,800	1,096	1,248	1,200	726	.63	.72
Maryland	2,228	3,458	1,368	1,248	1,950	756	.56	.68
Virginia	12,989	21,117	7,830	7,806	10,500	5,220	.47	.57
West Virginia	7,162	12,954	4,917	3,641	5,100	2,499	.44	.60
North Carolina	4,479	5,328	1,825	692	840	357	.55	.70
South Carolina	495	320	164	-----	-----	-----	.95	.89
Georgia	1,213	1,440	640	317	300	192	.78	.71
South Atlantic	30,093	46,417	17,840	14,953	10,890	9,750	.50	.61
Kentucky	4,231	4,606	720	346	558	90	.50	.77
Tennessee	3,417	3,375	936	232	300	96	1.20	.86
Alabama	865	1,100	252	-----	-----	-----	.88	.89
Mississippi	243	260	51	-----	-----	-----	.89	.94
Arkansas	3,016	3,124	1,368	1,492	1,173	696	.54	.66
Louisiana	28	30	8	-----	-----	-----	.95	1.05
Oklahoma	685	378	387	87	60	66	.74	.64
Texas	272	150	158	-----	-----	-----	.93	.90
South Central	12,758	13,023	3,880	2,157	2,091	948	.74	.76
Montana	318	420	562	233	330	336	1.01	.63
Idaho	4,781	5,000	4,209	4,021	3,969	4,026	.54	.48
Wyoming	42	24	53	-----	-----	-----	1.85	.82
Colorado	3,056	2,000	2,294	2,626	1,500	2,172	.61	.42
New Mexico	828	1,082	726	563	540	495	.78	.76
Arizona	84	96	77	28	30	24	1.68	1.35
Utah	851	400	924	552	210	591	.86	.61
Nevada	45	35	41	-----	-----	-----	1.57	.85
Washington	28,885	31,400	28,980	24,617	25,893	23,760	.70	.52
Oregon	6,371	4,160	4,950	4,333	2,079	3,150	.53	.46
California	9,166	9,112	[3] 9,045	5,084	4,647	5,100	.80	.59
Western	54,428	53,719	[3] 51,861	42,056	39,198	39,654	.69	.52
United States	180,262	202,415	[3] 139,156	97,119	103,776	84,819	.65	.59

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Included in "Total crop." By commercial crop is meant that portion of the total crop which is sold for consumption as fresh fruit.

[2] Preliminary.

[3] Includes 220,000 bushels not harvested on account of market conditions. Prices and value are computed on harvested crop.

TABLE 158.—*Apples: Car-lot shipments in eastern and western areas and United States by months, 1923–24 to 1932–33*

State group, and season	Crop-movement season [1]													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Total eastern:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923–24	91	1,985	2,739	11,438	28,093	12,918	3,425	3,473	3,146	3,731	2,196	1,391	553	75,179
1924–25	175	1,601	2,165	9,017	24,490	11,195	3,082	3,031	2,596	2,323	1,423	942	230	62,270
1925–26	379	2,436	3,562	12,960	24,844	10,313	3,211	3,319	3,817	3,805	2,243	1,234	379	72,502
1926–27	165	2,271	2,035	11,728	26,133	14,232	4,358	5,110	5,422	3,675	2,279	1,295	476	79,179
1927–28	243	1,507	2,480	7,754	15,868	6,927	2,310	2,353	1,966	1,434	870	504	199	44,415
1928–29	196	1,867	2,881	11,645	23,355	8,210	3,512	3,665	2,899	2,170	1,258	766	284	62,708
1929–30	512	1,697	2,651	10,426	18,068	5,634	2,438	2,780	2,581	2,440	1,307	602	303	51,439
1930–31	388	1,915	1,732	6,194	14,370	6,990	2,820	3,161	2,715	1,857	666	357	91	43,256
1931–32 [2]	339	1,714	1,015	7,121	18,624	9,139	3,151	4,168	3,947	2,837	1,327	574	228	54,184
1932–33 [2]	231	1,086	803	4,828	10,965	4,421	1,849							
Total western:														
1923–24	61	1,375	1,383	5,251	21,783	13,653	4,636	4,826	5,067	2,639	1,273	904	154	63,005
1924–25	30	761	961	5,624	15,376	9,036	3,317	2,263	1,427	954	872	673	279	41,573
1925–26	54	459	768	7,945	20,051	9,772	4,161	2,934	3,038	2,423	1,871	1,260	566	55,302
1926–27	95	1,569	1,352	9,222	19,188	9,019	4,007	2,859	2,598	1,673	1,317	1,060	412	54,371
1927–28	10	308	1,059	4,352	17,688	10,182	3,653	2,962	2,934	2,066	1,485	1,315	665	48,679
1928–29	34	1,585	1,449	7,760	22,546	11,564	4,797	4,109	4,850	3,248	1,686	944	250	64,822
1929–30	2	325	1,140	3,570	19,621	9,014	3,544	3,443	3,816	2,777	2,355	1,372	383	51,362
1930–31	32	1,412	1,198	7,165	22,482	10,761	5,415	4,787	4,521	3,896	2,430	1,714	725	66,538
1931–32 [2]	61	1,435	966	5,890	12,286	5,481	4,188	4,085	4,344	3,635	2,401	1,838	916	47,526
1932–33 [2]	44	1,509	882	3,881	12,941	6,320	4,181							
Total United States:														
1923–24	152	3,360	4,122	16,689	49,876	26,571	8,061	8,299	8,213	6,370	3,469	2,295	707	138,184
1924–25	205	2,362	3,126	14,641	39,866	20,231	6,399	5,294	4,023	3,277	2,295	1,615	509	103,843
1925–26	433	2,895	4,330	20,905	44,895	20,085	7,372	6,253	6,855	6,228	4,114	2,494	945	127,804
1926–27	260	3,840	3,387	20,950	45,321	23,251	8,365	7,969	8,020	5,348	3,596	2,355	888	133,550
1927–28	253	1,815	3,539	12,106	33,556	17,109	5,963	5,315	4,900	3,500	2,355	1,819	864	93,094
1928–29	230	3,452	4,330	19,405	45,901	19,774	8,309	7,774	7,749	5,418	2,944	1,710	534	127,530
1929–30	514	2,022	3,791	13,996	37,689	14,648	5,982	6,223	6,397	5,217	3,662	1,974	686	102,801
1930–31	420	3,327	2,930	13,359	36,852	17,751	8,235	7,948	7,236	5,753	3,096	2,071	816	109,794
1931–32 [2]	400	3,149	1,981	13,011	30,910	14,620	7,339	8,253	8,291	6,473	3,728	2,412	1,144	101,710
1932–33 [2]	275	2,595	1,685	8,709	23,906	10,741	6,030							

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop movement season extends from June of one year through June of the following year.
[2] Beginning January, 1932, figures are preliminary.

TABLE 159.—*Apples: Car-lot shipments, by State of origin, 1922–23 to 1931–32*

State	Crop-movement season [1]									
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Maine	290	918	2,115	1,320	660	889	227	1,333	989	154
New Hampshire	187	311	805	498	339	515	355	322	719	71
Vermont	154	91	324	321	316	563	324	630	490	591
Massachusetts	284	246	587	302	477	298	388	275	975	48
New York	30,080	20,434	16,631	29,499	21,680	10,030	13,671	9,253	15,429	9,069
New Jersey	447	399	130	441	340	701	354	331	906	200
Pennsylvania	2,050	4,033	1,706	2,486	4,988	3,005	2,796	2,401	2,765	3,313
Ohio	425	1,051	1,046	1,022	1,739	837	1,547	438	196	1,643
Ind	220	428	274	407	723	113	528	186	210	611
Illinois	6,297	6,832	5,867	6,561	6,149	2,552	5,046	2,326	3,388	4,779
Michigan	6,076	9,266	3,443	6,008	4,328	2,002	2,651	4,053	1,884	2,819
Wisconsin	205	387	253	420	387	366	432	595	151	139
Missouri	3,083	4,050	2,939	3,056	2,015	736	1,758	758	541	1,295
Kansas	1,083	1,412	1,294	1,165	675	1,458	516	670	249	1,252
Delaware	1,751	1,590	1,384	1,896	2,099	1,352	1,352	820	1,353	724
Maryland	1,150	2,181	1,239	1,333	2,491	1,792	1,722	1,852	1,378	2,048
Virginia	6,975	9,830	13,079	7,397	18,674	8,686	20,282	16,705	7,402	17,172
West Virginia	2,240	7,332	3,762	3,927	7,393	7,054	6,608	7,385	3,381	6,987
Arkansas	2,620	2,763	3,451	3,191	1,842	629	1,265	417	331	331
Montana	351	461	173	29	343	149	527	391	388	252
Idaho	4,230	6,935	2,223	7,485	3,677	7,709	6,508	7,119	6,972	5,354
Colorado	3,385	2,718	2,404	3,193	2,877	2,228	2,804	2,322	1,082	1,093
New Mexico	445	1,368	864	1,112	785	467	305	966	212	280
Utah	718	947	338	1,198	450	428	611	196	1,089	3
Washington	28,291	37,633	25,156	35,046	34,729	30,280	41,317	34,220	45,217	34,558
Oregon	3,895	6,428	5,615	4,702	6,422	3,396	6,447	2,680	5,624	2,139
California	4,961	6,505	4,891	2,531	5,084	4,020	6,300	3,462	5,953	3,847
Other States	2,088	1,635	1,950	1,258	1,868	839	889	695	520	938

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included. See Table 158 for United States totals.

[1] Crop-movement season extends from June of one year through June of the following year.
[2] Beginning January, 1932, figures are preliminary.

TABLE 160.—*Apples: Cold-storage holdings 1923–1932*

Year	Oct. 1	Nov. 1	Dec. 1	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1
BARRELS									
	1,000 barrels	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*
1923–24	584	4,226	5,010	4,512	3,634	2,755	1,768	1,044	430
1924–25	479	3,173	3,709	3,254	2,498	1,803	1,046	504	165
1925–26	885	3,749	4,245	3,855	3,157	2,288	1,307	617	221
1926–27	484	3,188	4,564	4,077	3,178	2,152	1,286	650	220
1927–28	449	1,864	2,055	1,699	1,266	846	501	262	121
1928–29	652	2,978	2,889	2,354	1,678	1,128	652	319	108
1929–30	735	2,189	2,097	1,762	1,316	897	481	229	96
1930–31	500	1,571	1,456	1,197	834	482	200	86	38
1931–32	398	2,285	2,177	1,944	1,322	762	369	165	63
1932–33	389	1,242	1,349	......	......	......	......	......	......
BUSHEL BASKETS									
	1,000 baskets	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*	*1,000 baskets*
1923–24	241	1,179	1,400	1,351	1,078	808	471	208	64
1924–25	193	1,138	1,374	1,167	940	608	314	117	29
1925–26	519	2,056	2,419	2,103	1,672	1,138	672	329	124
1926–27	352	2,235	2,713	2,472	2,037	1,589	952	533	199
1927–28	724	3,309	3,905	3,177	2,315	1,536	900	460	222
1928–29	1,084	4,932	5,057	4,240	3,204	2,171	1,308	590	220
1929–30	1,793	6,379	6,613	5,507	4,005	2,805	1,555	763	309
1930–31	1,982	6,748	6,946	5,996	4,460	2,855	1,300	571	193
1931–32	2,032	9,787	10,817	9,681	7,694	5,182	2,737	1,269	465
1932–33	2,342	9,881	10,533	......	......	......	......	......	......
BOXES									
	1,000 boxes	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
1923–24	789	6,886	13,866	14,201	11,550	8,821	5,837	2,901	949
1924–25	829	6,620	9,917	9,089	7,264	5,206	3,412	1,801	674
1925–26	1,091	9,165	13,041	11,868	10,009	7,898	5,350	2,892	1,104
1926–27	1,809	9,523	15,083	13,365	10,435	7,298	4,613	2,312	717
1927–28	1,043	9,074	13,423	12,260	9,809	7,023	4,960	2,889	1,223
1928–29	1,854	12,333	17,452	15,853	12,388	7,995	4,889	2,224	631
1929–30	901	11,045	15,235	13,108	10,149	7,282	4,790	2,446	761
1930–31	2,135	15,669	21,267	19,137	15,347	11,371	6,852	3,683	1,425
1931–32	3,203	15,472	16,849	14,617	11,761	8,789	5,866	3,392	1,364
1932–33	2,414	12,873	14,852	......	......	......	......	......	......
TOTAL[1]									
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1923–24	2,781	20,742	30,297	29,088	23,529	17,895	11,613	6,240	2,304
1924–25	2,460	17,274	22,419	20,019	15,699	11,283	6,804	3,429	1,197
1925–26	4,266	22,487	28,194	25,536	21,153	15,900	9,942	5,073	1,890
1926–27	3,612	21,321	31,458	28,068	22,005	15,342	9,423	4,794	1,602
1927–28	3,114	17,976	23,493	20,534	15,923	11,097	7,363	4,134	1,808
1928–29	4,893	26,199	31,177	27,164	20,626	13,551	8,153	3,772	1,174
1929–30	4,900	23,991	28,139	23,902	18,192	12,778	7,787	3,895	1,358
1930–31	6,618	27,129	32,580	28,725	22,317	15,672	8,751	4,512	1,731
1931–32	6,429	32,115	34,197	30,129	23,421	16,257	9,729	5,157	2,019
1932–33	5,922	26,481	29,433	......	......	......	......	......	......

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

[1] 1 barrel is considered the equivalent of 3 boxes or 3 bushel baskets.

TABLE 161.—*Apples* [1]: *International trade, average 1925–1929, annual 1928–1931*

Country	Average, 1925–1929		1928		1929		1930		1931 [2]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
United States	14,448	137	13,635	112	16,856	268	15,850	157	17,785	36
Canada	3,626	542	2,977	634	4,665	440	6,390	485	4,783	424
Australia [3]	2,161	0	3,619	0	1,342	0	3,621	0	2,770	0
France [4]	1,876	608	956	615	405	1,382	1,314	1,737	1,733	3,348
Italy	1,597	1	1,405	1	1,907	1	1,908	3	1,535	6
Netherlands	1,309	422	585	391	1,738	557	448	778	721	911
Belgium	1,122	303	773	274	1,108	404	1,005	704	486	964
Rumania	[5] 784	[5] 0	-	-	-	-	604	3	-	-
Yugoslavia	763	[5] 2	463	0	1,125	6	2,688	2	865	5
New Zealand	665	31	814	21	789	30	1,072	27	1,081	12
Total	28,271	2,046	25,227	2,048	29,935	3,088	34,900	3,896	31,759	5,706
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	14,247	0	13,401	0	12,832	0	13,583	0	17,007
Germany	34	8,415	17	9,777	37	7,501	40	11,195	157	5,444
Sweden	0	754	0	874	0	998	150	683	0	829
Denmark	1	684	0	638	0	825	3	674	0	912
Irish Free State	2	469	4	441	2	441	6	449	0	475
Egypt	2	379	3	345	3	487	[4] 1	360	2	194
Norway [4]	0	202	0	186	0	219	0	170	-	210
Brazil	0	191	0	214	0	268	0	114	0	146
Finland	0	178	0	210	0	218	0	166	0	141
Cuba	0	96	0	93	0	78	0	80	-	-
Poland	18	88	25	49	7	274	150	484	7	375
Total	57	25,703	49	26,228	49	24,141	350	27,958	166	25,733

Bureau of Agricultural Economics. Official sources.

[1] Foreign weights are converted to bushels on the basis of 48 pounds per bushel; domestic, 1 barrel equals 3 boxes or bushels.
[2] Preliminary. [3] Year ended June 30. [4] Includes pears. [5] 3-year average.

TABLE 162.—*Apples: Average price, New York, by months, 1927–28 to 1932–33*

L. C. L. PRICE PER BARREL TO JOBBERS

Variety and crop season	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
Baldwin:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1927–28	-	-	5.93	6.31	6.44	7.28	8.02	8.25	8.69	-	-	7.27
1928–29	-	-	5.16	[1] 5.19	[1] 5.30	[1] 5.12	5.16	5.00	5.83	-	-	5.25
1929–30	-	-	5.74	5.72	5.43	5.49	5.60	6.34	5.86	-	-	5.74
1930–31	-	-	3.44	4.22	4.24	4.59	5.18	5.56	5.95	-	-	4.74
1931–32	-	-	-	3.12	2.66	2.66	3.11	3.59	3.53	-	-	3.11
1932–33	-	-	-	-	-	-	-	-	-	-	-	-
McIntosh (New York State):												
1927–28	7.31	7.72	8.86	9.24	9.94	10.31	-	-	-	-	-	8.90
1928–29	-	7.77	10.08	10.03	9.80	9.58	9.10	-	-	-	-	9.39
1929–30	8.47	7.76	8.57	8.71	8.80	9.53	-	-	-	-	-	8.64
1930–31	-	-	6.15	5.62	5.22	5.39	6.06	6.11	-	-	-	5.76
1931–32	4.33	5.20	5.81	5.86	5.70	5.82	-	-	-	-	-	5.45
1932–33	-	-	3.62	3.21	-	-	-	-	-	-	-	-
Rhode Island Greening:												
1927–28	-	6.48	7.80	8.00	8.50	9.75	-	-	-	-	-	8.11
1928–29	-	5.12	5.42	5.22	5.16	5.40	5.20	-	-	-	-	5.25
1929–30	-	6.10	7.05	6.84	6.34	6.70	-	-	-	-	-	6.61
1930–31	-	[1] 3.46	3.51	4.08	3.96	3.84	4.82	-	-	-	-	3.94
1931–32	-	-	3.92	3.98	3.49	3.47	3.78	-	-	-	-	3.73
1932–33	-	-	2.55	2.34	-	-	-	-	-	-	-	-

[1] Less than 10 quotations.

TABLE 162.—*Apples Average: price, New York, by months, 1927–28 to 1932–33*—Con.

WEIGHTED AVERAGE AUCTION PRICE PER BOX

Variety and crop season	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Delicious:												
1927–28	4.24	3.52	3.65	3.67	3.78	3.89	4.20	4.10	3.83			3.78
1928–29	2.78	2.51	2.49	2.75	2.81	3.10	3.37	3.24	3.29	3.80		2.86
1929–30	3.35	3.30	3.13	3.21	3.23	3.33	3.36	3.58	3.48	3.63	2.04	3.31
1930–31	2.70	2.49	2.56	2.58	2.51	2.40	2.39	2.41	2.45	2.03	1.88	2.44
1931–32	2.38	2.09	2.06	2.12	1.88	2.05	2.09	2.28	1.94	1.70		2.07
1932–33	2.12	1.71	1.64	1.61								
Jonathan:												
1927–28	2.84	2.65	2.31	1.94	1.59		2.47					2.52
1928–29	2.30	1.77	1.89	1.97	2.03	2.39						1.92
1929–30	2.85	2.78	2.45	1.04	2.27	2.00	2.02	1.76				2.64
1930–31	2.23	1.80	1.82	1.69	1.77							1.86
1931–32	1.65	1.46	1.24	1.18	1.15	1.05	.88	1.30				1.39
1932–33	1.99	1.40	1.36	1.15								
McIntosh:												
1927–28	2.70	2.92	3.15	2.90	2.92	2.93	3.23	3.77	4.36			3.06
1928–29	2.59	2.11	2.06	1.99	2.16	2.34	2.19	2.30	2.83			2.16
1929–30	2.86	2.38	2.41	2.42	2.61	2.81	3.26	3.63	3.55			2.68
1930–31	1.75	2.02	1.96	1.84	1.70	1.78	2.01	2.33	2.60			1.92
1931–32	1.61	1.92	2.04	1.96	1.82	1.84	2.05	2.05	1.99	2.36		1.97
1932–33	1.65	1.35	1.29	1.32								
Rome Beauty:												
1927–28		2.72	2.63	2.61	2.69	2.65	2.84	2.84	3.15	2.76		2.73
1928–29	2.70	2.10	1.94	2.05	2.07	2.11	2.14	2.20	2.61	2.74		2.12
1929–30	3.17	2.71	2.35	2.42	2.41	2.40	2.37	2.80	2.54	2.61		2.49
1930–31	2.27	1.98	1.79	1.70	1.68	1.76	1.89	1.99	2.07	1.88	1.29	1.84
1931–32	2.35	1.76	1.54	1.51	1.42	1.36	1.38	1.39	1.30	1.26	.81	1.44
1932–33	1.68	1.52	1.30	1.30								
Winesap: [2]												
1927–28			3.28	3.07	3.06	2.97	2.95	2.94	2.83	2.45	1.82	2.76
1928–29			1.70	2.26	2.41	2.44	2.53	2.46	3.10	3.68	4.33	2.77
1929–30			2.64	2.61	2.61	2.63	2.43	2.64	2.67	3.01	3.13	2.67
1930–31			2.15	2.16	2.13	2.00	2.16	2.23	2.27	2.08	2.09	2.14
1931–32		1.52	1.78	1.77	1.52	1.47	1.53	1.60	1.42	1.52	1.48	1.53
1932–33			1.35	1.49								
Winter Banana: [3]												
1927–28	2.96	2.49	2.52	2.49	2.75	2.71	2.29	2.34				2.71
1928–29	2.26	1.73	1.95	1.98	1.95	2.27		1.77				1.99
1929–30	2.56	2.37	2.10	2.32	2.39	2.08	2.00	2.07				2.42
1930–31	1.68	1.53	1.38	1.44	1.37	1.57		1.59				1.63
1931–32	1.25	1.30	1.18	1.27	1.09	1.58		.90	.85			1.30
1932–33	1.34	1.00		.71								
Yellow Newtown:												
1927–28		2.69	3.02	2.62	2.52	2.80	2.86	3.11	3.28	3.18	1.90	3.01
1928–29		2.06	2.23	2.20	1.94	2.25	2.25	2.50	2.92	3.50	3.58	2.82
1929–30			2.97	2.32	2.73	2.74	2.90	2.83	2.98	3.04	2.88	2.93
1930–31		2.04	2.79	1.84	1.95	1.87	1.99	2.11	2.32	2.49		2.24
1931–32		1.84	1.96	1.80	1.38	1.62	1.70	1.88	2.06	2.08	1.24	1.94
1932–33		1.62	1.41	1.32								

Bureau of Agricultural Economics. L. c. l. prices compiled from daily market reports from the bureau *representative* at New York. *Average prices as shown are based on stock of good merchantable quality* and condition, 2½ inch unless otherwise stated; they are simple averages of daily range of selling prices. Average for season is simple average of monthly averages. Auction prices compiled from New York Daily Fruit Reporter, deciduous section, and are weighted by number of boxes sold.

[2] Average for the season includes a price in August as follows: 1927–28, $0.79; 1930–31, $1.78; 1931–32, $0.94.

[3] Average for the season includes a price in August preceding the crop year as follows: 1927–28, $2.96; 1928–29, $2.26; 1930–31, $2; 1931–32, $2.06.

TABLE 163.—*Apples: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	188.6	166.7	121.4	108.0	114.0	114.6	114.0	121.3	125.0	129.1	129.4	131.3	117.4
1924–25	159.3	141.3	121.6	109.8	115.9	119.5	128.2	144.9	150.7	155.4	158.4	179.2	122.1
1925–26	201.4	158.7	130.7	112.5	120.5	127.7	137.4	146.3	146.3	139.8	143.2	148.2	127.0
1926–27	168.7	133.8	103.8	88.4	80.2	81.6	87.7	97.3	98.8	100.0	103.8	113.5	88.3
1927–28	140.0	144.4	135.8	130.7	134.7	141.8	152.4	161.7	168.3	177.0	183.3	190.6	141.7
1928–29	188.7	156.0	105.5	96.6	99.4	107.9	118.5	124.1	129.9	134.1	133.5	147.9	110.3
1929–30	153.1	160.5	138.9	131.0	137.9	135.6	143.4	148.3	154.0	155.2	159.9	168.2	141.4
1930–31	173.6	144.8	106.3	103.2	98.4	96.7	98.8	103.8	106.0	105.5	117.1	121.9	102.7
1931–32	131.5	107.9	77.4	70.7	58.9	61.3	64.7	66.4	66.4	71.2	79.2	82.7	67.0
1932–33	92.1	86.2	65.1	57.4	57.2	57.1	61.7						

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by car-lot shipments.

TABLE 164.—*Apricots: Production and value, California, 1923–1932*

Item	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [1]
Production......short tons..	210,000	142,000	150,000	176,000	208,000	175,000	215,000	[2] 200,000	[2] 277,000	[2] 270,000
Average price per ton, crop-marketing season..dollars..	25.00	46.00	54.00	63.00	57.00	50.00	63.00	39.00	29.00	17.70
Farm value, basis average price, crop-marketing season..........1,000 dollars..	5,250	6,532	8,100	11,088	11,856	8,750	13,545	7,476	7,917	4,549

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.
[2] Includes some fruit not harvested on account of market conditions (but not included in computing value), as follows: 1930, 8,300 tons; 1931, 4,000 tons; 1932, 13,000 tons.

TABLE 165.—*Artichokes, commercial crop: Acreage, production, and price per box, 1929–1932*

State	Acreage				Production				Seasonal farm price per box			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 boxes* [1]	*1,000 boxes* [1]	*1,000 boxes* [1]	*1,000 boxes* [1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California.......	8,900	8,150	7,500	6,330	988	1,011	818	570	2.36	1.50	1.70	2.10

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Boxes containing approximately 40 pounds.

TABLE 166.—*Asparagus, commercial crop: Acreage, production, and price per crate, 1929–1932*

Utilization	Acreage				Production				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates* [1]	*1,000 crates* [1]	*1,000 crates* [1]	*1,000 crates* [1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market..............	45,840	52,140	63,190	72,770	3,347	4,373	5,165	5,549	2.65	2.24	1.98	1.43
For manufacture..........	45,760	44,670	38,840	38,070	6,026	6,014	4,024	3,500	.98	.97	.90	.66
Total..............	91,600	96,810	102,030	110,840	9,373	10,387	9,189	9,049	1.58	1.51	1.51	1.13

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Crates containing approximately 24 pounds.

TABLE 167.—*Avocados: Production and value, California, 1924–1932*

Item	1924	1925	1926	1927	1928	1929	1930	1931	1932 [1]
Production......short tons..	129	233	625	319	1,125	396	2,110	2,525	1,545
Average price per ton, crop-marketing season..dollars..	720	540	400	680	330	658	260	166	185
Farm value, basis average price crop-marketing season............1,000 dolls..	93	126	250	217	371	261	549	419	286

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 168.—*Beans, Lima, commercial crop: Acreage, production, and price per bushel or per pound, 1929–1932*

Utilization	Acreage				Production				Seasonal farm price			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market	4,670	9,910	8,670	9,800	348	587	571	652	1.86	1.46	1.55	1.07
					1,000 lbs.[2]	*1,000 lbs.*[2]	*1,000 lbs.*[2]	*1,000 lbs.*[2]	*Cents*	*Cents*	*Cents*	*Cents*
For manufacture	24,570	30,980	28,760	15,830	25,061	25,953	30,614	17,009	4.3	4.3	3.9	2.8

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 28 pounds, unshelled.
[2] Reported on shelled basis.

TABLE 169.—*Beans, snap, commercial crop: Acreage, production, and price per bushel or ton, 1929–1932*

Utilization	Acreage				Production				Seasonal farm price			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market	94,380	110,580	115,690	120,140	8,937	[2] 10,298	[2] 9,884	[2] 10,955	1.63	1.39	1.28	0.99
					Short tons	*Short tons*	*Short tons*	*Short tons*				
For manufacture	65,040	78,690	52,710	29,820	92,300	90,400	68,700	43,800	62.72	62.12	53.00	38.40
Total	159,420	189,270	168,400	149,960	199,544	213,976	187,308	175,260	101.85	92.63	87.05	71.23

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 24 pounds.
[2] Includes some quantities not harvested on account of market conditions, 437,000 bushels in 1930, 150,000 bushels in 1931, and 695,000 bushels in 1932. Price refers to harvested portion of crop.

TABLE 170.—*Beans, snap: Car-lot shipments, by State of origin, 1921–1932*

State	Calendar year [1]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	28	11	33	61	62	39	31	49	69	30	98	68
New Jersey	111	68	15	100	48	56	203	110	61	114	129	58
Maryland	22	149	49	136	127	197	235	246	214	352	479	238
Virginia	79	268	101	899	570	841	877	657	1,025	541	598	660
North Carolina	128	219	261	559	459	550	504	690	736	998	711	626
South Carolina	331	503	585	517	334	449	425	439	779	682	721	563
Georgia	26	65	26	68	27	52	96	48	152	230	175	139
Florida	367	715	1,644	1,157	1,992	946	2,583	2,700	3,254	4,118	4,319	6,941
Tennessee	23	63	81	248	84	174	45	119	132	233	83	50
Mississippi	79	252	47	85	88	130	143	192	312	310	208	282
Arkansas	------	1	2	7	13	18	18	69	92	130	36	27
Louisiana	202	90	107	439	683	588	662	822	1,156	744	857	525
Texas	39	26	88	210	407	414	471	294	356	654	607	394
Colorado	------	2	------	------	5	------	5	3	58	165	76	10
California	60	20	26	32	118	127	60	116	77	119	92	78
Other States	65	144	59	154	116	126	123	132	153	139	159	140
Total	1,560	2,596	3,124	4,692	5,133	4,707	6,481	6,686	8,626	9,559	9,348	10,799

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included. Beginning 1931 figures include lima beans in pod.

[1] Crop-movement season is for calendar year except Florida which begins in October of the preceding year.
[2] Preliminary.

TABLE 171.—*Beets, commercial crop: Acreage, production, and price per bushel or ton, 1929–1932*

Utilization	Acreage				Production				Seasonal farm price			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market	10,510	10,580	10,970	10,740	1,802	2,017	[2] 2,439	1,851	0.65	0.61	0.41	0.40
					Short tons	*Short tons*	*Short tons*	*Short tons*				
For manufacture	6,920	10,720	4,750	3,020	35,930	55,940	30,190	22,080	17.42	15.39	11.73	8.29
Total	17,430	21,300	15,720	13,760	86,386	112,416	[2] 98,482	73,908	20.80	18.61	13.64	12.61

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 56 pounds.
[2] Includes some quantities not harvested on account of market conditions, 495,000 bushels in 1931. Price refers to harvested portion of crop.

TABLE 172.—*Cabbage: Car-lot shipments, by State of origin, 1921–1931*

State	Crop-movement season [1]										
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	9,315	10,274	9,086	11,816	12,545	12,898	14,080	8,636	10,609	11,917	12,014
Pennsylvania	300	406	317	409	552	523	420	252	302	216	194
Ohio	318	589	538	658	414	544	765	581	555	66	484
Illinois	107	144	289	279	198	195	193	329	296	355	188
Michigan	477	908	732	644	573	287	375	428	256	153	137
Wisconsin	2,908	5,875	6,415	4,955	5,409	5,177	4,547	6,412	5,395	5,959	3,156
Minnesota	592	1,192	989	1,552	873	1,125	1,009	1,493	1,200	683	493
Iowa	150	566	390	541	265	459	435	566	442	504	184
Maryland	325	448	220	509	238	166	293	266	428	67	75
Virginia	3,528	2,937	3,326	3,400	2,225	1,814	2,720	2,444	3,969	1,772	1,821
North Carolina	251	222	364	275	356	341	292	254	261	214	189
South Carolina	3,247	3,235	4,299	1,530	3,421	2,671	1,900	2,209	2,549	2,731	1,864
Florida	1,617	2,998	1,172	3,842	1,936	1,667	1,051	1,168	3,136	2,271	3,261
Kentucky	103	73	85	107	45	17	24	33	75	25	30
Tennessee	181	563	270	348	317	609	667	823	1,256	952	330
Alabama	1,001	1,364	1,564	908	1,270	1,586	1,803	861	857	676	1,166
Mississippi	509	1,629	1,134	605	674	990	710	1,249	1,689	931	1,148
Louisiana	313	334	456	103	644	331	592	592	549	265	616
Texas	1,847	4,049	1,356	7,281	4,048	6,093	5,546	7,242	7,905	5,347	8,916
Colorado	2,523	1,964	3,174	1,473	1,432	1,274	683	1,162	810	1,164	602
Washington	170	104	155	52	102	154	139	82	168	85	105
California	788	835	684	364	650	663	360	798	512	837	243
Other States	357	520	473	430	836	794	727	847	912	1,014	681
Total	30,927	41,229	37,488	42,081	39,024	40,378	39,331	38,727	44,131	38,204	37,897

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season covers 17 months, from December through the second following April; i. e., the 1921 season begins December, 1920, and ends April, 1922. Figures for certain States include shipments for month preceding or following the regular crop-movement season.
[2] Preliminary.

TABLE 173.—*Cabbage, commercial crop: Acreage, production and price per ton, by States, 1929–1932*

FOR MARKET AND SAUERKRAUT

Group and State	Acreage				Production				Seasonal farm price per ton [1]			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Fall:	*Acres*	*Acres*	*Acres*	*Acres*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
South Carolina	350	750	900	600	2,900	9,400	9,000	2,400	68.50	36.00	41.78	16.00
Virginia, Norfolk	180	300	109	100	1,100	1,300	100	200	50.00	35.00	43.50	28.00
Total	530	1,050	1,000	700	4,000	10,700	9,100	2,600	63.50	35.89	41.76	16.54
Early: [2]												
California	4,600	4,050	4,400	4,250	24,800	20,700	[3] 20,000	28,900	21.01	28.02	15.28	21.70
Florida	6,500	3,700	6,500	5,500	39,000	25,500	[3] 48,100	22,000	33.60	63.20	22.40	32.00
Louisiana, winter	3,500	3,000	2,800	2,260	16,400	9,900	11,500	8,100	22.10	35.75	16.60	28.50
Texas	25,000	21,200	30,900	22,900	155,000	103,900	[3] 188,500	114,500	13.68	46.35	5.60	25.75
Total	39,600	31,950	44,600	34,910	235,200	160,000	[3] 274,100	173,500	18.27	46.01	10.08	25.90
Second early:												
Alabama	2,050	1,550	1,950	1,280	10,200	7,800	13,300	9,600	20.00	45.00	14.00	48.50
Georgia	720	410	400	350	3,600	3,000	2,800	1,800	20.00	35.00	15.00	52.00
Mississippi	3,600	2,850	3,100	2,900	20,500	12,800	15,500	11,300	21.30	37.00	13.50	50.00
North Carolina	850	800	700	800	6,000	4,800	3,500	2,000	20.00	44.00	14.00	30.00
South Carolina	3,300	3,100	3,000	2,000	29,000	31,000	[3] 31,800	14,800	31.50	42.50	15.38	34.00
Virginia	4,800	4,750	4,150	3,550	37,800	20,200	[3] 18,400	8,800	25.37	28.47	18.92	40.00
Eastern Shore	1,900	1,250	1,000	950	17,500	6,200	5,200	2,300	20.00	25.00	18.80	40.00
Norfolk	2,900	3,500	3,150	2,600	20,300	14,000	13,200	6,500	30.00	30.00	19.00	40.00
Total	15,320	13,460	13,300	10,880	107,100	79,600	[3] 85,300	48,300	25.27	38.12	15.21	42.24
Intermediate:												
Arkansas	400	450	500	400	1,000	1,100	2,500	1,600	12.50	29.50	13.00	36.00
Illinois	1,890	2,320	2,090	2,200	16,100	20,000	12,500	19,800	19.75	16.40	16.15	5.00
Iowa	1,650	2,000	1,400	1,700	10,600	12,400	7,100	12,900	22.83	15.08	11.70	4.90
Kentucky	160	140	200	200	1,800	600	1,400	1,000	30.00	34.00	20.00	35.00
Maryland	2,320	2,500	1,780	2,220	16,500	10,200	9,600	6,700	19.88	35.20	14.27	35.00
Missouri	860	950	980	1,000	6,000	6,100	5,100	6,000	10.83	20.82	17.50	28.00
New Jersey	4,500	4,800	4,100	4,700	22,500	28,900	26,200	17,900	28.00	22.00	20.40	14.80
New Mexico	600	450	230	300	5,400	3,400	1,400	1,600	22.00	20.00	15.00	17.00

[1] On the late Danish crop, seasonal farm prices are computed only to Dec. 1.
[2] Season begins in fall of previous year.
[3] Includes some quantities not harvested on account of market conditions, 70,900 tons in 1931 and 24,300 tons in 1932. Price refers to harvested portion of crop.

TABLE 173.—*Cabbage, commercial crop: Acreage, production and price per ton, by States, 1929–1932*—Continued

FOR MARKET AND SAUERKRAUT—Continued

Group and State	Acreage				Production				Seasonal farm price per ton			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Intermediate—Continued.												
New York, Long Island	3,020	2,930	2,930	2,950	30,800	26,400	29,300	28,000	26.25	18.50	18.00	16.00
Ohio, southeast	840	350	1,050	600	7,400	700	[3] 11,600	2,700	25.30	27.45	19.00	16.70
Tennessee	3,000	2,730	2,200	1,430	17,700	18,800	10,600	7,900	20.90	27.25	16.65	33.00
Virginia, southwest	2,650	2,650	2,100	2,650	17,500	6,600	13,600	6,600	33.66	16.97	9.93	12.50
Washington	2,000	2,000	2,050	2,010	17,200	18,800	18,400	16,100	11.00	15.75	13.00	12.00
Total [4]	23,890	24,270	21,610	22,360	170,300	152,000	[3] 149,300	128,800	23.14	20.66	16.19	15.36
Late (domestic):												
Colorado	1,400	1,700	1,600	1,760	12,200	19,000	11,800	[3] 17,600	22.13	9.37	18.00	7.50
Indiana	1,960	2,350	2,360	1,770	12,700	15,000	15,300	14,700	11.89	9.27	12.30	5.50
Michigan	2,960	3,780	3,320	3,290	18,400	22,700	21,600	32,900	9.84	8.11	6.20	4.00
Minnesota	1,050	1,210	1,150	1,170	8,200	9,000	5,300	8,800	8.78	10.89	11.60	5.85
New York	9,980	11,750	10,000	10,000	97,800	94,000	80,000	[3] 110,000	13.85	8.89	6.30	3.35
Ohio	2,900	3,580	2,670	2,560	24,900	20,800	23,800	23,600	7.71	7.79	6.00	4.25
Oregon	1,600	1,630	1,600	1,600	8,000	13,000	14,400	12,000	18.00	15.00	11.50	8.00
Pennsylvania	1,120	1,180	1,130	1,100	11,200	9,400	8,700	9,900	16.79	21.38	10.00	6.05
Utah	300	630	310	550	4,000	9,800	3,200	8,200	15.40	5.90	16.00	2.25
Wisconsin	10,200	14,800	10,000	9,900	81,600	111,100	54,000	79,200	12.00	8.39	7.00	3.80
Total [4]	33,470	42,610	34,140	33,700	279,000	323,800	238,100	[3] 316,000	12.98	9.21	8.08	4.22
Late (Danish):												
Colorado	1,900	2,200	2,200	2,390	22,800	29,700	19,800	[3] 26,300	19.50	8.15	13.00	4.00
Indiana	200	350	350	420	1,800	1,800	2,600	2,200	19.00	18.00	12.90	4.50
Michigan	360	600	600	750	2,500	3,900	3,900	6,800	21.70	14.25	8.90	3.50
Minnesota	2,450	1,960	1,650	2,070	13,500	9,400	6,600	13,500	22.59	11.60	11.50	4.00
New York [4]	19,640	20,920	21,550	21,000	157,100	154,800	183,200	189,000	16.86	10.03	5.80	3.80
Ohio	430	450	420	440	3,000	2,900	3,200	2,600	14.85	11.90	11.00	5.00
Pennsylvania	670	710	700	600	4,700	4,600	5,600	5,400	20.00	10.85	8.00	6.00
Wisconsin	8,640	11,180	7,500	7,400	67,400	83,800	30,800	48,100	17.93	6.40	9.80	3.00
Total [4]	34,290	38,370	34,970	35,070	272,800	290,000	261,700	[3] 293,900	17.72	8.98	7.28	3.54
Miscellaneous [5]	70	230	280	50	600	1,300	1,200	400	8.33	11.54	10.61	6.00
Grand total	147,170	151,940	149,900	137,670	1,069,000	1,018,300	[3] 1,018,800	[3] 964,400	18.37	19.18	10.43	11.53

FOR SAUERKRAUT

New York	6,000	9,000	5,800	4,900	57,000	73,800	51,000	56,400	10.60	6.55	5.10	3.70
Ohio	2,700	3,300	2,200	2,080	23,200	19,100	18,900	19,100	7.15	7.20	5.60	4.10
Indiana	1,080	1,400	1,260	400	6,900	9,000	6,300	3,700	7.85	7.30	7.10	4.10
Illinois	670	600	550	450	5,000	8,200	1,600	4,000	15.10	10.00	10.60	4.10
Michigan	1,700	2,030	1,420	1,100	10,700	13,400	10,800	11,600	7.90	7.35	5.80	4.00
Wisconsin	5,500	7,200	5,000	4,300	47,300	61,200	28,500	32,700	11.00	8.50	6.20	4.20
Minnesota	500	540	380	200	4,000	4,200	2,300	2,200	7.00	7.00	6.70	5.40
Colorado	500	500	250	200	5,000	5,800	2,400	2,000	15.20	7.00	6.40	3.70
Washington	320	320	200	200	2,900	2,900	1,700	1,800	11.00	15.00	12.80	7.10
Other States [6]	1,640	2,660	1,630	1,290	12,800	15,600	10,300	9,300	11.12	10.43	8.58	5.83
Total	20,510	27,750	18,690	15,120	173,900	211,200	133,800	142,900	10.21	7.78	6.04	4.11

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and sauerkraut *manufacturers.*

[3] Includes some quantities not harvested on account *of market conditions, 70,900 tons* in 1931 and 24,300 tons in 1932. Price refers to harvested portion of crop.
[4] Includes quantities used by sauerkraut manufacturers.
[5] Miscellaneous quantities used for sauerkraut not *separately reported.*
[6] Other States include, Arkansas, California, Iowa, Maryland, Missouri, Montana, Nebraska, Oregon, Pennsylvania, Tennessee, *Utah*, and Virginia.

TABLE 174.—*Cantaloupes:*[1] *Car-lot shipments, by State of origin, 1921–1932*

State	Crop-movement season[2]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932[3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Indiana	644	894	681	822	1,089	629	415	465	389	184	278	239
Michigan	232	465	306	114	146	84	77	52	16	13	16	13
Delaware	942	843	818	511	657	551	427	427	286	193	233	190
Maryland	1,153	1,233	1,270	699	1,116	1,283	1,159	1,002	561	274	347	247
North Carolina	894	700	620	401	655	401	606	304	88	19	110	180
South Carolina	281	270	70	116	33	173	179	94	44	125	89	216
Georgia	619	1,632	217	586	117	136	108	104	76	138	83	83
Arkansas	1,554	1,002	337	1,052	1,245	1,127	788	854	413	245	443	544
Texas	156	186	387	456	498	514	242	244	176	358	758	585
Colorado	3,288	4,420	2,306	3,229	3,837	5,108	3,980	2,789	4,664	4,088	2,790	2,556
New Mexico	508	275	364	518	574	640	415	370	352	416	612	560
Arizona	1,504	1,558	1,208	2,145	3,833	3,712	5,217	5,901	5,457	5,834	4,542	3,109
Washington	208	371	207	298	221	145	252	258	382	282	150	105
California	13,166	15,304	16,486	19,930	18,707	18,320	22,406	25,307	26,850	23,626	25,707	17,265
Other States	666	777	646	617	1,091	601	486	523	289	384	424	407
Total	25,815	29,930	25,923	31,494	33,819	33,424	36,757	38,694	40,042	36,179	36,582	26,299

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Includes Honeydew and other miscellaneous melons. Melons other than cantaloupes were not reported separately until 1923. Shipments are as follows: 1923, 1,152 cars; 1924, 2,565 cars; 1925, 3,654 cars; 1926 6,484 cars; 1927, 6,516 cars; 1928, 9,719 cars; 1929, 11,894 cars; 1930, 12,352 cars; 1931, 12,207 cars; 1932, 9,103 cars.
[2] Crop-movement season extends from Apr. 1 through November of a given year. Figures for California include shipments in December, following the regular crop-movement season.
[3] Preliminary.

TABLE 175.—*Cantaloupes,*[1] *commercial crop: Acreage, production and price per crate, by States, 1929–1932*

Group and State	Acreage				Production				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Early:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California, Imperial	38,360	50,900	51,640	45,750	6,713	5,752	7,849	[3] 6,405	1.63	1.32	1.14	1.15
Florida	600	600	250	200	36	30	13	15	2.00	1.75	1.50	1.00
Texas	740	1,260	540	150	70	113	59	15	2.00	2.25	.81	2.00
Total	39,700	52,760	52,430	46,100	6,819	5,895	7,921	[3] 6,435	1.64	1.34	1.14	1.15
Second early:												
Arizona	11,500	15,700	13,800	12,500	2,024	2,088	1,725	[3] 1,500	1.25	.90	.85	.40
Arkansas	2,400	2,550	2,600	3,350	185	115	182	234	1.22	.90	.88	.45
California, other	14,020	15,330	15,680	18,180	2,734	2,851	2,540	[3] 3,036	.95	.99	.87	.62
Georgia	600	750	800	1,000	48	75	56	60	2.22	.80	.75	.50
Nevada	170	150	120	190	23	14	20	12	1.30	1.70	.84	.56
North Carolina	1,000	620	1,100	2,600	70	53	99	182	1.20	1.15	.70	.60
Oklahoma	500	500	750	560	38	38	64	45	1.25	1.10	.68	.55
South Carolina	510	600	1,200	2,000	26	72	150	190	1.90	.75	.55	.50
Texas, other	1,500	2,320	11,530	7,300	111	139	[3] 865	[3] 387	1.16	.95	.81	.40
Total	32,200	38,520	47,580	47,680	5,259	5,445	[3] 5,701	[3] 5,646	1.10	.95	.84	.51
Intermediate:												
Delaware	2,200	2,200	2,500	2,700	220	132	288	338	1.15	1.50	.75	.65
Illinois	900	900	1,020	1,070	94	63	82	96	1.45	1.75	1.25	.80
Indiana	4,180	4,390	4,610	4,610	418	255	438	507	1.50	1.55	1.15	.90
Maryland	6,800	7,010	7,550	8,100	578	386	680	834	1.45	1.55	.75	.86
New Mexico	1,570	1,800	2,100	3,400	196	243	258	[3] 391	1.00	1.50	1.17	.80
Tennessee	120	170	220	240	10	13	15	18	1.50	1.60	1.35	.90
Washington	1,850	1,950	1,600	1,650	278	224	197	198	.76	1.18	.75	.60
Total	17,620	18,420	19,600	21,770	1,794	1,316	1,958	[3] 2,382	1.27	1.48	.92	.81

See footnotes at end of table.

TABLE 175.—*Cantaloupes,[1] commercial crop: Acreage, production and price per crate, by States, 1929–1932*—Continued

Group and State	Acreage				Production				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Late:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Colorado	11,000	10,000	8,100	7,370	2,530	2,000	1,134	1,106	.83	1.20	.85	.70
Iowa	580	520	620	700	39	42	53	70	1.48	1.40	1.05	.50
Kansas	450	450	450	450	54	40	59	54	.81	1.05	.80	.65
Michigan	3,400	3,800	4,000	4,400	476	608	560	572	1.35	1.60	1.20	1.05
Nevada	320	280	260	250	40	44	22	38	1.75	1.00	1.25	1.00
New Jersey	2,500	3,100	4,000	5,000	275	388	420	625	1.25	1.25	1.00	.63
Ohio	300	360	540	650	27	41	57	72	1.75	1.85	1.09	1.00
Oregon	600	800	700	600	60	120	122	98	1.00	1.25	.75	.60
Total	19,150	19,310	18,670	19,420	3,501	3,283	2,418	2,633	.96	1.29	.97	.76
Grand total	108,670	129,010	138,280	134,970	17,373	15,939	[3] 17,998	[3] 17,096	1.30	1.21	1.00	.83

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Includes Honeyball, Honeydew, Casaba, and Persian melons not separately reported.
[2] Standard crates (45's) containing approximately 60 pounds.
[3] Includes some quantities not harvested on account of market conditions 433,000 crates in 1931 and 3,180,000 crates in 1932. Price refers to harvested portion of crop.

TABLE 176.—*Carrots, commercial crop for market: Acreage, production, and price per bushel, 1929–1932*

Marketing season	Acreage				Production [1]				Seasonal farm price to Dec. 1, per bushel			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[2]	*1,000 bush.*[2]	*1,000 bush.*[2]	*1,000 bush.*[2]	*Cents*	*Cents*	*Cents*	*Cents*
Fall	2,900	3,950	4,340	3,370	1,595	2,267	2,543	1,887	70	70	60	82
Early	10,500	10,650	8,730	8,950	2,667	2,163	[3] 2,250	1,855	31	34	19	64
Second early	8,730	7,650	10,660	9,430	[3] 3,514	3,093	[3] 4,484	3,918	62	76	52	64
Intermediate	2,200	2,150	1,710	1,660	538	[3] 706	[3] 573	[3] 456	98	91	79	58
Late	5,350	6,390	5,500	5,980	2,693	3,158	2,366	2,751	58	40	44	26
Total	29,680	30,790	30,940	29,390	[3] 11,007	[3] 11,387	[3] 12,216	[3] 10,867	56	57	49	61

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Including undetermined quantities used for canning in some States.
[2] Bushels containing approximately 50 pounds.
[3] Includes some quantities not harvested on account of market conditions, 300,000 bushels in 1929; 44,000 bushels in 1930; 1,634,000 bushels in 1931, and 25,000 bushels in 1932. Price refers to harvested portion of crop.

TABLE 177.—*Carrots: Car-lot shipments by State of origin, 1921–1931*

State	Crop-movement season [1]										
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	1,247	1,523	1,410	2,262	1,825	1,845	2,430	1,484	2,111	2,188	1,882
New Jersey	32	28	34	18	48	45	85	67	12	14	3
Illinois	62	82	24	3	23	2	13	96	33	37	38
Michigan	33	25	35	55	54	77	91	208	204	141	319
Virginia	1	10	2	1	40	10	44	137	110	67	47
Mississippi	81	304	142	266	197	209	496	230	108	28	12
Louisiana	43	62	58	32	106	70	177	99	71	84	41
Texas	198	48	65	282	575	1,136	903	1,685	2,860	2,145	1,181
Colorado	9	4	12	26	29	62	10	216	96	43	44
California	19	21	24	157	278	557	2,363	2,938	6,095	7,206	7,403
Other States	115	151	173	212	252	291	241	295	449	439	544
Total	1,840	2,256	1,979	3,314	3,427	4,304	6,853	7,455	12,149	12,392	11,514

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season begins in October of the previous year in such early shipping States as California, Louisiana, and Texas, and extends through June of the following year in order to include shipments from storage in Northern States and to have totals comparable with acreage and production figures.
[2] Preliminary.

TABLE 178.—*Cauliflower, commercial crop: Acreage, production, and price per crate, 1929–1932*

Marketing season	Acreage				Production				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall and winter	6,700	6,950	7,740	9,190	1,942	1,780	2,434	2,550	0.61	0.70	0.77	0.64
Early	9,000	9,320	8,250	8,640	2,516	2,271	2,189	2,123	.80	.85	.82	.66
Late	9,370	11,340	11,720	11,970	2,208	1,798	2,338	[2] 2,691	.89	.90	.68	.55
Total	25,070	27,610	27,710	29,800	6,666	5,849	6,961	[2] 7,364	.77	.82	.75	.61

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Crates containing approximately 37 pounds.
[2] Includes some quantities not harvested on account of market conditions, 176,000 crates in 1932. Price refers to harvested portion of crop.

TABLE 179.—*Celery, commercial crop: Acreage, production, and price per crate, 1929–1932*

Marketing season	Acreage				Production				Seasonal farm price to Dec. 1, per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall and winter	7,000	7,620	7,060	6,800	1,512	1,257	1,278	1,156	1.08	1.00	1.04	1.69
Early	7,620	7,800	7,580	8,520	2,877	2,711	2,640	2,599	1.58	2.52	2.44	2.00
Second early	850	800	1,100	1,800	604	616	610	[2] 857	2.28	1.60	1.86	.60
Intermediate	3,750	3,210	3,520	3,240	1,046	882	874	884	1.72	1.74	1.75	1.09
Late (sec. 1)	11,320	13,030	13,550	14,450	2,932	3,954	3,686	[2] 4,166	1.44	1.12	1.68	.60
Late (sec. 2)	1,330	1,480	1,630	1,690	460	480	490	522	1.64	1.25	1.47	1.04
Total	31,870	33,940	34,440	36,500	9,431	9,900	9,578	[2] 10,184	1.52	1.58	1.81	1.16

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Two-thirds size (New York) crates containing approximately 90 pounds.
[2] Includes some quantities not harvested on account of market conditions, 249,000 crates in 1932. Price refers to harvested portion of crop.

TABLE 180.—*Celery: Car-lot shipments, by State of origin, 1921–1931*

State	Crop movement season [1]										
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	3,047	3,247	3,742	4,529	4,492	4,898	5,893	4,192	3,847	5,451	3,875
New Jersey	219	115	219	177	149	138	106	32	53	32	25
Pennsylvania	224	212	223	225	208	194	169	71	105	81	61
Michigan	1,031	1,626	1,486	1,332	2,224	1,880	1,997	2,139	1,852	1,606	1,304
Florida	4,218	4,954	6,398	7,219	7,952	5,504	7,499	8,413	8,831	9,838	8,245
Idaho	9	26	49	48	29	19	46	121	262	287	97
Colorado	211	222	125	197	399	211	161	188	149	136	53
Oregon	53	82	205	363	398	511	625	605	673	647	622
California	3,469	2,625	4,419	4,748	4,554	6,226	7,696	8,384	9,580	8,480	8,358
Other States	77	102	82	99	109	80	125	135	138	69	100
Total	12,558	13,211	16,948	18,937	20,514	19,661	24,317	24,280	25,490	26,627	22,740

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season covers 20 months, from September through the second following April; i. e., the 1921 season begins September, 1920, and ends April, 1922.
[2] Preliminary.

TABLE 181.—*Cherries: Production in 10 States,[1] imports, and exports 1924–1932*

Year	Production											Imports, year beginning July			Exports, canned,[2] year beginning July
	New York	Michigan	Wisconsin	Montana	Idaho	Colorado	Utah	Washington	Oregon	California	10 States	Natural, in brine	Prepared or preserved	Total	
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1924	17, 500	16, 500	9, 550	265	1, 700	750	3, 800	4, 800	10, 400	13, 500	78, 765	4, 937	9, 175	14, 112	1, 612
1925	15, 300	11, 600	3, 550	310	2, 400	3, 900	5, 500	8, 400	7, 200	12, 000	70, 160	2, 904	11, 153	14, 057	1, 688
1926	16, 400	13, 800	9, 700	385	3, 200	7, 600	5, 300	10, 500	15, 100	20, 000	101, 985	5, 733	15, 974	21, 707	2, 111
1927	10, 500	6, 800	3, 150	350	1, 300	4, 600	3, 800	4, 100	11, 300	12, 000	57, 800	15, 136	1, 048	16, 184	1, 719
1928	9, 600	21, 500	10, 250	130	3, 100	1, 650	4, 600	9, 700	11, 500	18, 500	90, 530	13, 173	384	13, 557	2, 202
1929	14, 670	14, 062	4, 600	720	3, 100	5, 100	3, 200	15, 550	8, 500	16, 300	85, 802	22, 362	866	23, 228	1, 897
1930	25, 000	19, 000	5, 200	560	3, 200	3, 500	3, 500	16, 500	12, 640	17, 500	106, 600	7, 926	1, 280	9, 206	1, 232
1931	[3] 17, 000	22, 900	6, 000	590	3, 000	2, 500	2, 400	10, 000	7, 900	[3] 23, 000	[3] 95, 290	5, 943	148	6, 091	643
1932[4]	[3] 25, 627	22, 780	6, 864	780	3, 402	3, 825	4, 200	16, 125	12, 025	[3] 18, 000	[3] 113, 628	------	------	------	------

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board. Trade figures compiled from Monthly Summary of Foreign Trade of the United States, June issues. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Estimates include only certain States where total production can be calculated from commercial sales (shipments, canning, cold pack, etc.) and differs from previously published commercial estimates for some States by an increased allowance for farm and local use.
[2] Fresh cherries not separately reported.
[3] Includes some quantities not harvested on account of price as follows: New York, 1931, 2,550 tons; 1932, 6,663 tons; California, 1931, 3,000 tons; 1932, 1,000 tons.
[4] Preliminary.

TABLE 182.—*Citrus-fruit production, by States, 1899, 1909, 1919–1932* [1]

Year	Oranges								Grapefruit					Lemons	Limes
	7 States	California	Florida [2]	Texas	Arizona	Alabama [3]	Louisiana	Mississippi	4 States	California	Florida [2]	Texas	Arizona	California	Florida
	1,000 boxes	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
1899 [4]	6, 167	5, 882	273	------	11	(5)	1	------	31	18	12	------	1	874	------
1909 [4]	19, 530	14, 440	4, 888	11	33	1	152	5	1, 186	123	1, 062	(5)	1	2, 756	11
1919	22, 842	15, 265	7, 400	9	80	20	37	31	6, 095	263	5, 800	3	29	3, 499	28
1920	30, 005	21, 296	8, 500	------	60	82	42	25	5, 738	304	5, 400	------	34	4, 955	------
1921	20, 582	12, 640	7, 700	------	80	82	50	30	6, 795	360	6, 400	------	35	4, 050	------
1922	30, 671	20, 106	10, 200	4	81	175	60	45	8, 073	394	7, 600	35	44	3, 400	------
1923	37, 484	24, 137	12, 900	6	86	225	75	55	8, 893	363	8, 400	65	65	6, 732	------
1924	29, 847	18, 100	11, 600	12	60	(5)	75	0	9, 265	387	8, 600	211	67	5, 125	36
1925	33, 623	24, 200	9, 100	10	86	100	100	27	8, 190	600	7, 300	200	90	7, 316	30
1926	39, 229	28, 167	10, 700	20	75	75	150	42	8, 865	650	7, 800	340	75	7, 712	12
1927	31, 644	23, 000	8, 200	30	54	110	200	50	8, 586	720	7, 200	490	176	6, 000	0
1928	54, 160	38, 705	15, 000	68	99	38	220	30	12, 455	972	10, 500	772	211	7, 900	6
1929	34, 034	24, 400	8, 800	261	137	212	187	37	11, 095	1, 000	8, 200	1, 530	365	5, 900	8
1930	54, 694	35, 105	19, 000	250	139	3	195	2	18, 825	1, 290	16, 000	1, 135	400	7, 950	8
1931	49, 734	34, 900	13, 800	520	145	70	245	54	15, 147	2, 017	10, 200	2, 480	450	7, 800	9
1932 [6]	48, 788	33, 400	14, 300	500	147	120	241	80	13, 221	2, 200	9, 200	1, 350	471	7, 000	10

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Estimates of production for 1929 and 1930 revised on basis of 1930 Census. Earlier years not so revised.

[1] The figures in this table of production include fruit consumed on farms, sold locally and used for manufacturing purposes, as well as that shipped. The figures do not include fruit which ripened on the trees but which was destroyed by freezing or storms prior to picking. For California the figures relate to the crop produced from the bloom of the year shown, fruiting through the winter and through the spring and summer of the following year, being picked from Nov. 1 of the year shown to Oct. 31 of the following year. Fruit not picked until after the latter date is included with the crop of the following year. For all States except California the estimates include all fruit picked after about Sept. 1 of the year shown. The estimates for oranges include tangerines.
[2] From prospects on Dec. 1, commercial shipments of Florida citrus fruits from the 1932 crop were estimated at 11,800,000 boxes of oranges, and 6,700,000 boxes of grapefruit, compared with 11,200,000 boxes of oranges and 7,700,000 boxes of grapefruit shipped from the 1931 crop.
[3] For years 1919–1932, equivalent in standard boxes, each equal to about 2 of the "half straps" commonly used.
[4] Census. Size of boxes not specified.
[5] 500 boxes or less.
[6] As estimated from prospects on Dec. 1.

TABLE 183.—*Citrus-fruit: Car-lot shipments, by State of origin, 1921–22 to 1931–32*

ORANGES [1]

State	Crop movement season [2]										
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
California	28, 376	48, 346	44, 905	34, 439	47, 017	53, 511	43, 693	68, 797	43, 053	64, 774	61, 611
Florida	[4] 15, 718	23, 006	33, 431	25, 091	19, 625	22, 536	16, 453	32, 550	17, 312	33, 915	22, 768
Alabama	145	476	600	2	338	179	312	97	485	2	175
Mississippi	------	9	13	------	8	4	15	5	25	1	40
Louisiana	------	------	3	2	1	1	251	264	278	155	84
Texas	------	------	3	3	6	9	26	33	156	119	200
Arizona	78	71	94	45	96	73	33	66	90	90	66
Total	44, 317	71, 908	79, 049	59, 582	67, 091	76, 313	60, 783	101, 812	61, 399	99, 056	84, 944

GRAPEFRUIT

State	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
Florida	12, 943	16, 969	19, 614	20, 087	14, 269	17, 304	14, 166	21, 844	13, 955	26, 081	17, 658
Texas	8	48	99	521	298	747	1, 036	1, 617	3, 493	2, 247	5, 329
California	462	567	446	431	558	593	780	780	1, 194	1, 220	1, 050
Arizona	62	103	155	159	218	210	211	272	417	436	206
Louisiana	------	------	------	------	------	------	------	------	1	2	------
Total	13, 475	17, 687	20, 314	21, 198	15, 343	18, 854	16, 193	24, 513	19, 060	29, 986	24, 933

LEMONS

State	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
California	9, 907	8, 946	13, 388	11, 680	13, 981	13, 529	12, 745	17, 181	13, 564	18, 377	15, 697
Texas	------	------	1	[5] 2	------	------	------	------	------	------	------
Arizona	------	1	2	1	1	------	------	------	2	1	------
Total	9, 907	8, 947	13, 391	11, 683	13, 982	13, 529	12, 745	17, 181	13, 566	18, 378	15, 697

MIXED CITRUS [6]

State	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
Florida	------	2, 631	3, 608	4, 226	3, 565	5, 313	6, 225	9, 109	8, 216	14, 687	8, 824
California	------	1, 033	1, 424	1, 148	1, 605	1, 672	1, 590	1, 783	1, 343	1, 626	1, 656
Texas	------	18	1	18	------	22	92	185	501	288	520
Arizona	------	3	------	10	1	10	11	24	48	29	16
Louisiana	------	------	------	------	------	------	1	1	10	155	87
Total	------	3, 685	5, 033	5, 402	5, 171	7, 017	7, 919	11, 102	10, 118	16, 785	11, 103

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Includes tangerines and satsumas.
[2] Crop movement season extends as follows: California, from Nov. 1 through October of the following year; all other States from Sept. 1 through August of the following year, except lemons from Nov. 1 through October of the following year.
[3] Preliminary.
[4] Includes 1 car in August, 1921.
[5] Reported in October, 1924.
[6] No reports available before 1922.

TABLE 184.—*Grapefruit, Florida: Weighted average auction price per box, New York, by months, 1924–25 to 1932–33*

Crop season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1924–25				2.83	2.83	2.71	3.78	4.38	5.94	(1)	
1925–26	4.96	3.97	3.95	4.01	4.03	4.61	5.16	4.70	4.74	5.51	4.38
1926–27	5.35	4.07	3.40	3.58	3.75	3.67	3.59	3.66	3.80	2.44	3.66
1927–28	4.60	4.70	4.71	4.82	5.07	5.52	5.45	4.92	3.93	6.28	[2] 4.93
1928–29	4.41	4.25	3.44	3.52	3.20	3.30	3.32	3.83	4.71	6.36	3.70
1929–30	4.51	4.23	4.26	4.43	4.09	4.78	5.09	4.25	3.24	3.10	[3] 4.42
1930–31	3.64	3.00	2.82	2.56	2.43	2.50	2.76	2.67	2.06	1.17	[4] 2.69
1931–32	3.09	2.60	2.26	2.14	1.97	2.23	2.76	3.44	3.76	3.12	[5] 2.53
1932–33	3.65	3.01	2.28								

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those published in Yearbooks prior to 1930.

[1] Reported for 1 week only.
[2] Includes a price in August, 1928, of $4.51.
[3] Includes a price in September, 1929, of $5.80.
[4] Includes a price in September, 1930, of $4.03.
[5] Includes a price in September, 1931, of $4.32.

TABLE 185.—*Lemons: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Italy	6,972	0	6,609	0	6,822	0	8,035	0	7,782	0
Spain	474	0	340	0	618	0	690	0	414	0
Total	7,446	0	6,949	0	7,440	0	8,725	0	8,196	0
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	1,857	0	1,655	0	1,965	0	2,171	0	2,061
Germany [2]	24	1,682	28	1,655	23	1,859	28	2,158	29	2,245
United States	257	909	251	943	267	634	206	1,056	258	271
Belgium [3]	4	244	4	90	5	111	7	125	14	2,143
Czechoslovakia	0	436	0	382	0	459	0	480	0	580
Canada	0	351	0	385	0	370	0	379	0	394
Poland	0	297	0	288	0	251	0	263	0	402
Rumania	[4] 0	[4] 220					0	207		
Netherlands	28	182	35	170	36	188	34	238	29	226
Hungary	0	171	0	202	0	196	0	200	0	194
Switzerland	0	154	0	165	0	167	0	205	1	223
Yugoslavia	0	139	0	144	0	135		173		183
Total	313	6,732	318	6,089	331	6,435	275	7,655	331	8,922

Bureau of Agricultural Economics. Official sources.

[1] Preliminary.
[2] Includes oranges and similar fruits in exports.
[3] Includes oranges and similar fruits, except for imports for 1928, 1929, and 1930.
[4] 3-year average.

TABLE 186.—*Lemons, California: Weighted average auction price per box, New York, by months, 1924–25 to 1932–33*

Crop year	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1924–25	------	------	4.47	4.45	4.59	4.75	5.73	6.84	4.66	4.67	8.55	6.83	------
1925–26	4.13	4.46	3.91	4.16	5.40	4.12	4.83	3.79	4.83	4.38	3.56	4.50	4.35
1926–27	3.82	4.03	4.20	3.43	3.90	3.50	3.89	4.50	6.44	6.37	8.82	9.27	4.64
1927–28	6.92	6.13	6.33	6.03	5.19	5.54	6.42	6.04	6.97	6.11	5.59	5.19	6.07
1928–29	4.90	5.62	5.26	3.95	4.07	4.55	3.82	6.89	5.39	7.82	11.87	11.22	5.82
1929–30	8.70	8.63	5.68	5.06	4.81	5.51	7.24	6.15	7.26	7.93	5.36	4.23	6.42
1930–31	4.18	4.52	4.89	4.08	4.47	4.06	4.43	5.05	6.57	6.55	7.28	5.66	5.30
1931–32	3.98	4.04	3.87	3.81	3.80	3.27	4.96	4.47	5.16	7.03	8.56	8.48	5.09
1932–33	5.40	5.12	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those published in Yearbooks prior to 1930.

TABLE 187.—*Oranges: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year: Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Spain	20,935	1	24,268	3	22,407	1	30,654	0	24,173	1
Italy	3,435	0	2,245	0	2,613	0	3,744	0	3,431	0
United States	3,285	14	2,678	24	5,512	0	2,236	0	4,849	0
Palestine	[2] 2,123	0	2,151	0	1,813	0	2,998	0	2,667	0
Union of South Africa	734	0	694	0	1,002	0	1,763	0	1,675	0
Brazil	571	0	605	0	1,096	0	812	0	2,054	0
Japan	449	0	464	0	440	0	378	0	275	0
Cuba	120	0	0	0	0	0	9	0	------	------
Total	31,652	15	33,105	27	34,683	1	42,594	0	39,124	1
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	11,307	0	10,753	0	12,859	0	13,774	0	14,310
Germany	0	6,259	0	7,340	0	6,741	0	9,948	0	7,851
France [3]	81	3,793	106	4,008	23	3,572	24	5,649	49	5,984
Canada	0	2,237	0	2,212	0	3,128	0	2,163	0	------
Netherlands	591	1,833	666	1,938	743	2,027	21	2,581	616	2,316
Belgium	------	[2] 875	(4)	947	(4)	1,011	(4)	1,913	(4)	(4)
China	292	462	332	416	353	549	328	315	329	218
Switzerland	0	440	0	494	0	476	0	652	1	708
Czechoslovakia	0	416	0	384	0	390	0	791	0	788
Norway [3]	0	391	0	426	0	434	0	549	0	503
Sweden	0	357	0	399	0	440	1	747	1	797
Egypt	4	345	5	250	5	264	5	382	5	112
Hungary	0	293	0	360	0	296	0	415	0	338
Poland	0	256	0	134	0	123	1	146	0	122
Irish Free State	0	255	0	258	0	282	0	325	0	333
Denmark	0	234	0	243	0	241	0	299	0	289
Yugoslavia	0	161	0	179	0	180	0	253	0	216
Total	968	29,914	1,109	30,741	1,124	33,013	1,180	40,900	1,001	34,885

Bureau of Agricultural Economics. Official sources.

[1] Preliminary.
[2] 4-year average.
[3] Includes some lemons.
[4] Included with lemons.

TABLE 188.—*Oranges, California, Navel: Weighted average auction price per box, New York, by months, 1924–25 to 1932–33*

Crop season	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1924–25			4.64	4.47	5.35	5.48	6.51	6.21	
1925–26	8.00	4.56	4.24	4.55	4.70	5.50	4.73	5.56	4.80
1926–27	6.32	5.06	4.69	4.71	4.54	4.89	4.43	5.60	4.74
1927–28	(1)	5.55	4.56	5.18	5.52	5.98	7.39		
1928–29	5.72	4.40	4.84	3.89	3.52	4.06	3.56	3.56	4.10
1929–30	(1)	5.56	4.98	4.99	5.67	6.03	6.64		
1930–31	5.23	3.58	3.45	3.27	3.42	3.32	3.93	(1)	
1931–32	3.87	3.30	2.71	3.35	3.06	3.08	3.38		
1932–33	3.05	2.78							

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those published in Yearbooks prior to 1930.

[1] Reported for 1 week only.

TABLE 189.—*Oranges, California, Valencia: Weighted average auction price per box, New York, by months, 1925–1932*

Crop season	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Average [1]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1925	4.80	6.28	7.43	6.40	6.47	7.58	8.23	9.90	7.15
1926	4.92	4.58	4.46	5.21	4.89	5.30	6.44	6.79	5.28
1927	4.06	4.43	4.98	5.90	6.15	6.73	7.02	6.71	6.00
1928	5.94	7.38	7.22	7.58	7.45	7.77	7.53	6.79	7.45
1929	(2)	4.40	4.58	4.13	4.85	4.73	4.85	4.77	4.63
1930	6.59	7.97	7.19	7.36	7.33	7.29	8.69	7.78	7.59
1931		3.42	3.62	4.31	3.81	3.86	4.50	3.79	
1932	2.85	3.43	3.28	3.62	3.05	3.42	3.43	3.77	3.41

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those published in Yearbooks prior to 1930.

[1] Includes prices in December as follows: 1925, $2.14; 1926, $6.69; 1927, $5.75; 1929, $4.85; 1932, $4.07.
[2] Reported for 1 week only.

TABLE 190.—*Oranges, Florida: Weighted average auction price per box, New York, by months, 1924–25 to 1932–33*

Crop season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average [1]
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1924–25				3.68	4.26	5.69	6.43	7.82	8.26	
1925–26	7.45	7.19	4.00	4.25	4.44	5.02	5.80	5.87	6.72	5.10
1926–27	3.70	4.79	3.53	3.76	3.91	4.10	4.86	4.75	4.54	4.11
1927–28	3.67	6.31	5.59	5.23	5.97	6.29	6.84	8.58	9.11	6.24
1928–29	5.08	3.71	3.55	3.45	3.30	3.30	3.55	3.33	2.99	3.40
1929–30	3.42	4.04	4.21	4.49	4.44	4.98	7.13	7.42	6.60	4.94
1930–31	4.76	3.45	3.01	2.91	3.19	3.79	3.80	3.85	4.02	3.54
1931–32	2.64	3.20	3.11	3.10	3.38	3.55	3.75	3.63	3.59	3.43
1932–33	2.88	3.21	2.79							

Bureau of Agricultural Economics. Compiled from reports of California Fruit Growers Exchange. Prices weighted by number of boxes sold. These prices are a new series and are not comparable with those published in Yearbooks prior to 1930.

[1] Includes prices in other months as follows: 1926–27, $3.12 in July; 1928–29, $2.92 in July and $2.29 in August; 1930–31, $2.61 in September, 1930, $4.62 in July, 1931; 1931–32, $4.38 in July, 1932

Table 191.—*Corn, sweet, commercial crop for manufacture: Acreage, production, and price per ton,*[1] *by States, 1929–1932*

State	Acreage				Production				Seasonal farm price per ton			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Maine	14,850	13,200	10,200	8,600	46,000	48,800	35,700	29,200	24.70	26.30	19.30	11.40
New Hampshire	1,320	1,050	900	620	3,300	3,200	2,600	1,600	23.80	23.10	18.40	11.80
Vermont	2,370	2,100	1,280	750	6,200	4,800	3,200	1,100	18.20	17.70	12.40	11.40
New York	24,600	23,000	17,300	11,000	36,900	29,900	46,700	22,000	17.00	17.50	14.00	10.20
Pennsylvania	6,000	6,300	5,500	1,800	6,000	5,000	9,400	3,100	15.00	16.00	13.50	8.40
Ohio	31,000	32,500	30,300	8,800	62,000	35,800	72,700	16,700	11.20	11.30	9.90	5.00
Indiana	38,500	43,500	42,000	20,500	50,000	56,600	92,400	45,100	13.00	13.20	11.00	7.20
Illinois	64,000	72,000	70,000	35,000	134,400	144,000	161,000	87,500	12.80	13.00	10.60	7.30
Michigan	6,400	7,300	6,900	3,600	6,400	4,400	7,600	4,300	12.50	13.00	11.70	7.50
Wisconsin	11,600	13,000	12,500	2,400	24,400	31,200	28,800	5,800	11.80	11.10	10.10	7.00
Minnesota	45,800	54,000	48,700	31,000	109,900	129,600	87,700	89,900	11.00	10.40	9.50	7.10
Iowa	50,000	55,000	53,800	6,800	125,000	110,000	123,700	17,000	9.90	10.50	9.50	5.30
Nebraska	5,740	7,750	6,400	3,400	10,900	10,800	10,900	6,500	10.00	10.00	8.70	5.80
Delaware	3,900	3,630	3,400	2,000	5,800	6,500	8,200	3,400	13.00	13.00	10.50	6.50
Maryland	44,000	34,000	39,800	20,500	61,600	23,800	71,600	30,800	15.00	14.50	11.70	6.80
Tennessee	3,400	3,400	3,600	1,400	6,800	6,800	9,000	4,100	14.60	15.10	15.00	9.80
Other States[2]	3,830	3,830	4,150	2,760	8,800	8,400	10,400	5,500	13.89	14.01	11.52	8.92
Total	357,310	375,560	356,730	160,930	704,400	659,600	781,600	373,600	13.14	13.24	11.08	7.55

Bureau of Agricultural Economics. Estimates based upon returns from canning establishments.

[1] Tonnage in husk.
[2] Other States include Colorado, Idaho, Kansas, Kentucky, Missouri, Montana, Oklahoma, Oregon, South Dakota, Utah, Virginia, Washington, and Wyoming.

Table 192.—*Corn, canned: Pack*[1] *in the United States, 1920–1932*

State	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Maine	1,588	911	1,066	923	1,294	1,693	1,347	806	966	1,521	1,930	1,245	1,071
New York	829	564	616	434	749	1,311	1,038	676	666	782	647	1,080	496
Ohio	1,544	850	1,073	1,390	787	2,375	1,735	846	1,138	1,551	750	1,871	405
Indiana	861	709	665	1,208	846	2,223	2,044	703	1,131	1,250	1,272	2,362	1,139
Illinois	2,271	1,711	1,939	2,833	2,310	4,030	3,053	1,961	3,017	3,153	3,261	3,788	2,024
Wisconsin	590	576	625	648	388	1,148	843	310	578	547	686	712	140
Minnesota	643	573	598	898	1,199	1,541	1,762	1,088	1,648	2,604	2,912	1,835	2,018
Iowa	3,246	1,190	1,959	2,382	1,764	4,105	3,361	1,377	2,541	2,908	2,552	3,227	444
Maryland	2,217	1,130	1,944	2,256	1,707	3,678	2,133	1,493	1,648	1,865	622	1,956	801
Other States	1,251	629	934	1,134	1,087	2,216	1,753	1,087	1,164	1,306	1,060	1,339	820
United States	15,040	8,843	11,419	14,106	12,131	24,320	19,069	10,347	14,497	17,487	15,692	19,415	9,358

Bureau of Agricultural Economics. Compiled from National Canners' Association data, 1920–1926; Bureau of Census, 1927–1929; beginning 1930, Foodstuffs Division, Bureau of Foreign and Domestic Commerce.

[1] Stated in cases of 24 No. 2 cans.

Table 193.—*Cranberries: Production and average price, by States, average, 1924–1928, and annual 1929–1932*

State	Production					Average price per barrel received by producers, crop-marketing season			
	Average, 1924–1928	1929	1930	1931	1932[1]	1929[2]	1930[2]	1931	1932
	Barrels	*Barrels*	*Barrels*	*Barrels*	*Barrels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Massachusetts	377,800	400,000	370,900	450,000	360,000	13.25	10.00	6.00	7.00
New Jersey	150,600	90,000	144,000	142,000	80,000	12.00	9.75	5.50	7.00
Wisconsin	44,200	42,000	40,000	45,000	75,000	13.50	12.50	7.00	7.75
Washington		11,000	3,480	9,000	7,536	14.25	12.75	7.50	8.50
Oregon		5,800	3,000	5,000	2,300	14.50	13.50	7.50	8.50
United States	588,320	548,800	560,480	651,000	524,836	13.10	10.15	5.99	7.14

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary. [2] Dec. 1 price.

TABLE 194.—*Cucumbers, commercial crop: Acreage, production, and price per bushel, 1929–1932*

Marketing season	Acreage				Production				Seasonal farm price per bushel			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall	980	1,100	2,680	1,350	75	99	197	79	3.60	2.50	1.52	1.99
Early (sec. 1)	12,810	18,100	15,500	12,950	1,272	[2] 1,260	[2] 1,266	[2] 798	2.54	2.09	1.12	1.10
Early (sec. 2)	11,760	15,950	12,530	11,750	1,214	[2] 2,317	[2] 1,055	[2] 961	1.14	.56	.57	.54
Second early	6,220	10,400	8,800	6,540	780	[2] 1,233	556	464	1.88	.43	.57	.54
Intermediate	7,300	8,200	8,640	7,520	1,011	962	1,285	708	1.14	1.11	.58	.68
Late (sec. 1)	1,350	1,870	2,460	2,540	139	214	392	164	1.63	.92	.52	.60
Late (sec. 2)	880	1,000	1,450	2,050	111	109	118	[2] 108	1.28	1.02	1.10	1.00
Total	41,300	56,620	52,060	44,700	4,602	[2] 6,194	[2] 4,869	[2] 3,282	1.71	1.10	.76	.75

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Bushels containing approximately 48 pounds.
[2] Includes some quantities not harvested on account of market conditions, 1,551,000 bushels in 1930; 234,000 bushels in 1931, and 279,000 bushels in 1932. Price refers to harvested portion of crop.

TABLE 195.—*Cucumbers: Car-lot shipments, by State of origin, 1921–1932* [1]

State	Calendar year											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	540	395	383	694	686	456	607	1,001	529	907	714	407
New Jersey	271	164	258	276	481	201	368	370	161	117	149	57
Ohio [3]	118	124	68	111	91	187	203	191	119	131	208	104
Indiana [3]	25	18	6	16	57	104	135	147	126	63	35	25
Illinois [3]	164	68	15	77	245	150	101	148	116	254	151	94
Delaware	137	191	225	240	302	304	366	214	163	119	225	154
Maryland	343	368	440	311	598	479	692	563	469	527	680	280
Virginia	19	221	84	387	448	200	339	229	179	166	148	101
North Carolina	641	687	1,175	1,639	1,562	869	935	812	651	691	439	527
South Carolina	664	887	720	918	794	687	910	663	1,043	1,107	716	709
Georgia	3	211	45	154	72	62	72	76	135	162	82	159
Florida	1,414	2,034	1,647	1,381	1,963	2,048	2,300	1,572	2,271	1,137	1,463	608
Alabama	109	702	367	576	706	684	583	606	795	882	470	259
Arkansas	62	8	24	93	145	234	228	328	195	131	107	124
Louisiana	9	21	6	28	6	36	36	58	113	144	93	117
Texas	64	119	46	147	72	316	178	382	294	893	678	677
Other States	249	131	185	134	264	195	121	108	108	232	122	33
Total	4,832	6,349	5,700	7,182	8,492	7,272	8,180	7,468	7,469	7,663	6,480	4,615

Bureau Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Cucumbers for pickling are not included.
[2] Preliminary.
[3] Principally hothouse stock.

TABLE 196.—*Dates: Production and value, California, 1924–1932*

Item	1924	1925	1926	1927	1928	1929	1930	1931	1932 [1]
Production ... short tons	214	340	522	710	817	865	1,560	1,200	2,150
Average price per ton, crop-marketing season ... dollars	360	282	342	302	262	222	140	80	100
Farm value, basis average price, crop-marketing season ... 1,000 dollars	77	96	179	214	214	192	218	96	215

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 197.—*Figs: Production and value, California and Texas, 1922–1932*

Year	Dried, California			Marketed fresh and canned, California			Preserving, Texas		
	Production	Average price, crop-marketing season	Farm value, basis average price for crop-marketing season	Production	Average price, crop-marketing season	Farm value, basis average price for crop-marketing season	Production	Average price, crop-marketing season	Farm value, basis average price for crop-marketing season
	Short tons	*Dollars*	*1,000 dolls.*	*Short tons*	*Dollars*	*1,000 dolls.*	*Short tons*	*Dollars*	*1,000 dolls.*
1922	11,000	120.00	1,320						
1923	9,500	90.00	855						
1924	8,500	100.00	850	2,135	104.00	222	1,180	102.00	120
1925	9,600	110.00	1,056	3,075	100.00	308	2,240	85.00	190
1926	*11,350*	*95.00*	*1,078*	*5,100*	*112.00*	571	4,977	68.00	338
1927	12,000	45.00	540	5,400	100.00	540	4,879	68.00	332
1928	11,500	45.00	518	6,130	87.00	533	6,513	65.50	427
1929	17,000	90.00	1,530	7,300	100.00	730	2,778	70.00	194
1930	21,000	48.00	1,008	7,700	90.00	693	2,961	56.00	166
1931	17,000	37.00	629	6,300	74.00	466	1,851	70.00	130
1932 [1]	17,000	25.47	433	6,000	34.00	204	504	50.00	25

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 198.—*Grapes: Production, average price per ton, imports and exports, United States, 1922–1932*

Year	Production			United States average price per ton, crop-marketing season [1]	United States value, basis average price, crop-marketing season [1]	Foreign trade, year beginning July [2]			
	Total, United States	California	Other States			United States domestic exports	United States imports	United States net exports [3]	
								Total	Percentage of production
	Short tons	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Short tons*	*Short tons*	*Short tons*	*Per cent*
1922	1,981,171	1,706,000	275,171	48.09	95,271,520	7,011	16,326	[4] 9,315	
1923	2,227,395	2,030,000	197,395	31.88	71,009,078	10,128	10,015	198	(5)
1924	1,777,722	1,535,000	242,722	41.79	74,297,480	10,151	1,608	8,566	0.5
1925	[6] 2,202,085	[6] 2,050,000	152,085	32.03	66,115,000	12,134	1,415	10,735	.5
1926	[6] 2,438,413	[6] 2,129,000	309,413	26.66	64,604,000	15,396	1,011	14,414	.6
1927	[6] 2,605,238	[6] 2,406,000	199,238	26.52	65,332,000	19.410	1,735	17,747	.7
1928	[6] 2,671,076	[6] 2,366,000	305,076	19.75	49,740,000	27,819	1,703	26,155	1.0
1929	2,077,587	1,827,000	250,587	27.23	56,574,000	23,079	2,687	20,448	1.0
1930	[6] 2,440,956	[6] 2,182,000	258,956	19.28	44,817,000	24,900	2,856	22,107	.9
1931	[6] 1,621,837	[6] 1,320,000	301,837	22.40	36,100,000	13,806	3,013	10,902	.7
1932 [7]	[6] 2,162,409	[6] 1,882,000	280,409	13.24	26,372,000				

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board. Prices are based upon returns from crop reporters. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] For years 1925–1928, the average price for the States reporting price, except California, is used for computing the value of the grape crop in the less important States for which no price is determined. Price and value are based on quantities actually harvested plus a quantity of fruit that was sold but left on the vines in 1930.

[2] Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1923–1926; January and June issues, 1927–1932.

[3] Total exports (domestic plus foreign) minus total imports.

[4] Net import equals total imports minus total exports (domestic plus foreign).

[5] Less than 0.05 per cent.

[6] Includes fruit in California not harvested as follows: 138,000 tons in 1925, 15,000 in 1926, 142,000 in 1927, 153,000 in 1928, 749,000 in 1930 including 316,000 sold but left on the vines, 10,000 in 1931, and 170,000 in 1932. (See also last sentence of Note 1.)

[7] Preliminary.

TABLE 199.—*Grapes: Car-lot shipments, by State of origin, 1921–1932*

State	Crop-movement season [1]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	2,535	7,720	4,312	5,641	3,763	7,242	3,050	3,752	2,541	2,049	4,240	1,623
Pennsylvania	390	1,558	847	1,166	589	1,350	689	1,076	879	809	1,290	618
Michigan	1,292	6,020	4,202	4,680	398	3,081	2,023	1,571	1,746	1,620	528	876
Iowa	77	237	217	79	50	176	196	234	369	226	185	210
Missouri	4	128	58	101	166	686	108	415	225	310	329	170
Arkansas	3	38	33	243	394	1,170	108	998	510	322	313	232
Washington	64	47	62	83	191	125	167	235	232	117	94	73
California	33,344	43,952	55,348	57,695	76,066	64,327	75,925	73,157	59,205	65,185	39,777	41,481
Other States	108	219	257	245	261	433	411	332	395	271	190	177
Total	37,817	59,919	65,336	69,933	81,878	78,590	82,677	81,770	66,102	70,915	46,946	45,460

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from June 1 through December of a given year. Figures for California include shipments in January and February, following the regular crop-movement season.
[2] Preliminary.

TABLE 200.—*Grapes: Number of packages of California varieties sold, and weighted seasonal average price,[1] auction sales in 11 markets,[2] 1927–1932*

Variety or type	Number of packages (crates or lugs)						Average price per package					
	1927	1928	1929	1930	1931	1932	1927	1928	1929	1930	1931	1932
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Flame Tokay	2,785	2,762	1,867	2,485	1,591	1,480	1.40	1.34	1.42	1.15	1.59	1.10
Emperor	236	103	56	41	991	703	1.15	1.15	1.62	1.06	1.61	1.11
Red Malga			113	119	157	274			2.20	1.79	1.93	1.17
Ribier			89	152	184	251			1.86	1.67	1.71	1.43
Thompson Seedless (Sultanina)	2,531	2,484	2,737	2,377	1,555	2,237	1.36	1.05	1.48	1.28	1.63	1.27
Malaga	3,719	3,129	2,045	2,096	2,976	1,351	1.22	1.17	1.37	1.08	1.22	.90
Muscat	4,660	4,888	2,754	2,455	931	2,770	1.02	.81	1.06	1.08	1.18	.76
Alicante	4,475	4,966	4,759	5,123	3,480	3,845	1.59	1.22	1.29	1.11	1.16	.91
Carignane	*1,313*	*1,711*	*1,541*	*1,973*	*1,654*	*1,476*	*1.32*	*1.06*	*1.14*	*.97*	*1.11*	*.73*
Cornichon	575	558	314	268	264	132	1.17	1.05	1.26	.98	1.26	.94
Mataro	299	320	199	176	172	204	1.30	.96	1.14	1.13	.99	.85
Mission	530	585	297	283	308	179	1.06	.88	1.23	.91	1.15	.68
Petit Syrah	316	365	276	235	113	152	1.35	.96	1.15	1.11	.92	.88
Zinfandel	1,592	1,680	1,425	1,112	624	1,309	1.30	1.00	1.14	1.06	1.05	.95
Total or average	23,031	23,551	18,472	18,895	15,000	16,363	1.30	1.08	1.29	1.11	1.29	.96

Bureau of Agricultural Economics. Compiled from daily reports of the fruit and vegetable market news service. Principal varieties only shown.

[1] Season begins about August 1 and ends in November.
[2] Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, Minneapolis, New York, Philadelphia, Pittsburgh, and St. Louis.

TABLE 201.—*Grapes: Estimated production and average price, by States, average 1924–1928, and annual 1930–1932*

State and division	Production				Average price per ton, crop marketing season [1]		
	Average, 1924–1928	1930	1931	1932 [2]	1930	1931	1932
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*
Maine	54	29	25	24	110.00	95.00	80.00
New Hampshire	91	48	46	43	110.00	95.00	80.00
Vermont	41	40	42	42	110.00	95.00	80.00
Massachusetts	512	416	369	334	90.00	75.00	65.00
Rhode Island	229	239	250	237	90.00	75.00	65.00
Connecticut	1,163	1,331	1,243	1,226	70.00	55.00	50.00
New York	75,106	75,624	97,378	67,971	36.00	22.00	19.00
New Jersey	2,543	3,017	3,084	3,230	45.00	40.00	35.00
Pennsylvania	18,714	22,420	30,600	22,977	43.00	22.00	16.00
North Atlantic	98,452	103,164	133,037	96,084			
Ohio	22,390	27,000	31,000	31,938	40.00	26.00	18.00
Indiana	3,560	2,550	3,250	3,108	40.00	38.00	19.00
Illinois	5,006	4,320	6,800	6,000	44.00	44.00	22.00
Michigan	54,300	65,130	57,270	71,775	33.00	28.00	16.00
Wisconsin	336	300	380	396	90.00	75.00	65.00
Minnesota	111	194	310	327	90.00	75.00	65.00
Iowa	5,020	5,803	6,700	7,650	65.00	56.00	30.00
Missouri	9,404	7,500	10,400	9,717	60.00	40.00	30.00
Nebraska	1,459	2,630	2,520	2,960	70.00	50.00	40.00
Kansas	3,208	3,300	4,800	4,810	75.00	50.00	40.00
North Central	104,795	118,727	123,430	138,681			
Delaware	1,404	2,200	1,989	2,352	45.00	40.00	35.00
Maryland	1,061	655	671	625	60.00	55.00	50.00
Virginia	2,280	1,590	1,970	1,488	80.00	80.00	60.00
West Virginia	1,227	804	1,804	1,008	85.00	80.00	60.00
North Carolina	5,905	4,300	5,100	3,431	70.00	80.00	45.00
South Carolina	1,511	994	1,033	750	85.00	85.00	60.00
Georgia	1,629	808	869	630	115.00	110.00	90.00
Florida	[2] 737	900	1,025	454	95.00	90.00	70.00
South Atlantic	15,459	12,251	13,961	10,738			
Kentucky	1,034	800	1,275	1,035	65.00	55.00	40.00
Tennessee	1,353	1,000	1,275	1,005	80.00	70.00	55.00
Alabama	801	650	720	509	90.00	80.00	65.00
Mississippi	270	240	281	178	100.00	90.00	75.00
Arkansas	8,060	6,400	10,440	12,936	50.00	40.00	26.00
Louisiana	38	44	54	42	100.00	90.00	75.00
Oklahoma	1,851	2,275	2,550	3,440	60.00	58.00	37.00
Texas	1,232	1,700	1,845	1,809	90.00	80.00	55.00
South Central	14,659	13,109	18,440	20,954			
Idaho	282	565	531	561	65.00	50.00	45.00
Colorado	306	290	280	462	65.00	50.00	45.00
New Mexico	517	700	1,058	1,050	70.00	55.00	50.00
Arizona	1,071	1,700	1,900	1,912	110.00	70.00	30.00
Utah	1,228	1,200	1,050	1,274	60.00	45.00	40.00
Nevada	235	100	80	90	105.00	90.00	85.00
Washington	2,966	5,000	5,400	5,963	35.00	22.00	13.00
Oregon	1,737	2,150	2,670	2,640	33.00	24.00	15.00
California	[3] 2,097,200	[3] 2,182,000	[3] 1,320,000	[3] 1,882,000	16.30	20.23	11.75
Wine varieties	[3] 422,800	[3] 486,000	[3] 316,000	[3] 388,000	20.00	19.00	12.00
Raisin varieties	[3] 1,240,800	[3] 1,308,000	775,000	[3] 1,177,000	13.95	16.26	10.90
Dry [4]	237,600	192,000	169,000	252,000	59.00	60.00	39.00
Not dried	[3] 290,400	[3] 540,000	99,000	[3] 169,000	12.80	24.90	18.73
Table varieties	[3] 433,600	[3] 388,000	229,000	[3] 317,000	20.83	35.30	16.00
Western	[3] 2,105,542	[3] 2,193,705	[3] 1,332,969	[3] 1,895,952			
United States	[3] 2,338,907	[3] 2,440,956	[3] 1,621,837	[3] 2,162,409	19.28	22.40	13.24

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Prices and value are computed on the harvested crop plus a quantity of fruit that was sold but left on the vines in 1930.
[2] Preliminary.
[3] *Includes some quantities not harvested on account of market conditions as follows:* Wine varieties, 1928, 18,000 tons; 1930, 40,000 tons; 1931, 10,000 tons; 1932, 42,000 tons; raisin varieties (not dried), 1925, *38,000 tons; 1928, 60,000 tons; 1930,* 635,000 tons including 316,000 sold but left on the vines; 1932, 21,000 tons table varieties, 1925, 100,000 tons; 1926, 15,000 tons; 1927, 142,000 tons; 1928, 75,000 tons; 1930, 74,000 tons 1932, 107,000 tons.
[4] Dried basis: 1 ton of dried raisins equivalent to 4 tons of fresh.

TABLE 202.—*Grapes, Concord: Average l. c. l. price to jobbers in 12-quart baskets, specified markets, by State of origin, October, 1924–1932*

Year	Price of New York Concords at—				Price of Michigan Concords at—		
	Boston	New York	Philadelphia	Pittsburgh	Chicago	Minneapolis	St. Louis
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1924	91	84	90	85	68		72
1925	102	114	104	109	109	118	
1926	61	62	56	60	43	67	56
1927	56	61	64	64	55	76	65
1928	60	54	49	51	44	59	53
1929	50	54	51	48	41	56	49
1930	57	51	64	48	41	53	56
1931		36	34	29	32	44	42
1932	32	31	31	24	18	28	23

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

TABLE 203.—*Lettuce, commercial crop: Acreage, production, and price per crate, by States, 1929–1932*

Group and State	Acreage				Production				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Early:[2]	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*1,000 crates*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Arizona	*16,500*	14,000	*18,100*	*13,000*	1,766	1,280	1,267	910	1.60	2.30	1.20	1.65
California (Imperial)	27,250	38,100	41,000	33,500	4,006	4,267	3,649	3,685	2.09	1.74	1.56	1.54
Florida	2,000	1,560	2,450	1,700	635	507	646	354	1.18	1.92	.78	1.24
Lettuce	1,500	1,100	1,600	1,000	405	248	371	184	1.29	2.20	.80	1.28
Escarole	500	460	850	700	230	259	275	170	1.00	1.65	.76	1.20
Texas	800	740	300	160	160	24	22	6	1.00	1.00	1.00	1.00
Total	46,550	54,400	61,850	48,360	6,567	6,058	5,584	4,955	1.84	1.87	1.39	1.54
Second early:												
Arizona	11,000	23,000	16,000	14,000	1,727	1,725	1,280	1,540	2.85	1.45	1.06	1.30
California (other)	*26,150*	*31,570*	*31,600*	*32,120*	2,693	*3,062*	3,729	2,634	*1.86*	2.02	*1.42*	*1.51*
North Carolina	1,160	1,400	1,500	1,200	136	130	201	43	1.65	.98	.60	1.78
South Carolina	*600*	*450*	*600*	200	104	*59*	93	*16*	*1.83*	*2.16*	*1.24*	*.76*
Total	38,910	56,420	49,700	47,520	4,660	4,976	5,303	4,233	2.22	1.80	1.30	1.43
Intermediate:												
Idaho	60	70	70	80	9	14	9	12	2.25	1.40	1.25	1.10
New Jersey	1,000	950	1,000	800	200	142	250	160	1.90	1.86	1.20	1.00
Oregon	70	80	80	160	6	8	6	14	1.30	1.05	.80	.75
Virginia	280	200	200	200	57	28	36	34	1.00	2.00	1.75	1.70
Washington	2,500	3,350	3,000	3,100	525	670	615	[3] 666	1.27	.75	.77	.65
Total	3,910	4,650	4,350	4,340	797	862	916	[3] 886	1.42	.99	.93	.77
Late (sec. 1):												
California	9,630	12,700	12,800	14,050	1,194	1,651	1,536	1,644	2.12	1.93	2.36	1.25
Colorado	*8,100*	*7,440*	*6,650*	*8,310*	*891*	*670*	*598*	[3] *831*	1.25	.85	1.30	.80
New Mexico	250	200	200	20	20	16	22	2	1.20	1.05	.90	1.25
New York	*5,800*	*5,450*	*5,100*	*5,650*	*1,740*	*1,499*	*1,122*	*1,186*	*1.13*	1.05	1.45	.26
Pennsylvania	80	80	80	80	12	11	13	16	1.20	1.05	1.50	.75
Total	23,860	25,870	24,830	28,110	3,857	3,847	3,291	[3] 3,679	1.46	1.39	1.84	.79
Late (sec. 2):												
California	24,500	29,750	32,250	31,900	4,067	3,540	4,096	3,541	1.74	1.89	1.68	1.32
Idaho	290	340	380	450	42	54	57	79	.75	1.00	1.10	.70
New Jersey	700	650	1,000	900	150	156	100	212	2.20	1.76	1.20	.60
Oregon	50	50	250	200	5	5	38	[3] 30	1.30	.80	.95	.48
Washington	350	450	450	500	72	90	81	[3] 100	1.50	.95	1.05	.75
Wyoming	40	40			3	3			1.30	.90		
Total	25,930	31,280	34,330	33,950	4,339	3,848	4,372	[3] 3,962	1.74	1.85	1.64	1.25
Grand total	139,160	172,620	175,060	162,280	20,220	19,591	19,466	[3] 17,715	1.82	1.71	1.48	1.27

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Western crates containing approximately 4 dozen heads.

[2] Season begins in fall of the previous year.

[3] Includes some quantities not harvested on account of market conditions, 500,000 crates in 1932. Price refers to harvested portion of crop.

TABLE 204.—*Lettuce: Car-lot shipments, by State of origin, 1921–1932*

State	Crop-movement season [1]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	3,240	3,167	3,817	3,698	3,821	3,019	3,496	3,140	3,704	3,219	3,291	2,498
New Jersey	469	572	456	416	463	303	308	144	169	27	18	9
North Carolina	445	622	718	714	537	540	447	477	363	364	498	110
South Carolina	716	987	576	424	736	372	369	241	310	169	278	46
Florida	2,910	2,899	2,926	2,490	2,190	707	950	880	1,117	560	940	440
Idaho	180	889	1,241	533	500	398	196	72	76	154	180	248
Colorado	234	812	1,436	1,036	3,096	2,795	2,848	2,368	2,109	1,610	1,004	596
Arizona	114	577	834	1,776	2,689	4,572	7,679	9,325	9,285	8,431	7,850	7,021
Washington	635	812	1,082	673	820	904	1,151	1,240	1,747	2,230	1,778	1,587
California	9,223	10,321	13,916	17,040	20,999	25,126	28,502	32,122	33,854	38,736	35,211	34,869
Other States	531	654	791	661	658	541	400	319	286	218	151	160
Total	18,697	22,312	27,793	29,461	36,509	39,277	46,346	50,328	53,020	55,718	51,199	47,584

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season begins in October of the previous year and extends through December of the given year, i. e., 1921 season begins in October, 1920, and extends through December, 1921.
[2] Preliminary.

TABLE 205.—*Olives: Production and value, California, 1923–1932*

Item	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [1]
Production ... short tons	17,000	6,500	14,000	12,000	21,500	23,900	21,000	20,000	16,000	22,000
Average price per ton, crop marketing season ... dollars	65.00	92.00	60.00	80.00	80.00	80.00	75.00	70.00	46.00	29.00
Farm value, basis average price, crop-marketing season ... 1,000 dolls	1,105	598	840	960	1,720	1,912	1,575	1,400	736	638

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 206.—*Olive oil (including inedible): International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Spain	164,975	2	263,197	0	113,251	0	235,678	0	206,921	0
Italy	66,494	1,769	29,698	3,509	79,269	313	159,698	132,561	129,738	180,581
Tunis	53,947	1,458	30,880	2,485	95,803	11	109,301	151	28,758	713
Greece	28,599	[2] 123	20,216	83	31,766	4	18,514	7	21,604	0
Algeria	28,466	115	48,096	38	28,505	162	54,152	78	18,309	43
Turkey	18,185	[3] 198	5,034	[4] 42	33,872	[4] 521	10,452	[4] 4	-------	-------
Syria and Lebanon [4]	4,283	339	904	295	5,618	180	6,397	413	-------	-------
Morocco	4,206	282	10,375	186	6,802	417	8	1,361	0	2,762
Yugoslavia	1,077	861	1,120	1,319	2,238	400	322	542	182	402
Total	370,232	5,147	409,520	7,957	397,124	2,008	594,517	135,117	405,512	184,501

[1] Preliminary.
[2] 2-year average.
[3] 4-year average.
[4] International Yearbook of Agricultural Statistics.

TABLE 206.—*Olive oil (including inedible): International trade, average 1925–1929, annual 1928–1931*—Continued

Country	Calendar year: Average 1925–1929 Exports	Average 1925–1929 Imports	1928 Exports	1928 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL IMPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	0	135,847	0	131,214	0	153,005	0	162,860	0	119,363
Argentina [4]	0	95,334	0	116,417	0	112,309	0	130,715		
France	13,958	40,146	17,508	40,286	13,199	45,251	25,446	72,390	24,105	50,861
United Kingdom	324	19,100	273	20,727	338	20,541	269	21,179	208	19,004
Cuba	0	16,654	0	18,927	0	16,831	0	20,983		
Chile	0	14,103	0	26,679	0	7,796	0	6,741	0	5,290
Uruguay	0	13,410	0	18,577	0	13,790	0	18,753		
Brazil	0	12,808	0	20,005	0	9,814	0	18,399	0	5,848
Norway	0	7,098	0	7,163	0	10,453	0	5,882	0	2,960
Macao (Portuguese China) [4]	[3] 2,331	[2] 6,813	838	6,395						
Portugal	5,722	6,659	13,541	362	3,331	2,246	[4] 8,020	[4] 26,510	3,979	7,004
Palestine	710	5,726	479	7,835	361	7,666	1,147	2,148	1,762	94
Canada	0	4,044	0	5,132	0	4,732	0	6,487	0	5,590
Switzerland	2	3,443	0	3,734	0	3,701	0	4,847	9	4,096
Egypt	32	2,666	35	2,196	26	2,946	24	3,907	9	2,394
Germany	53	2,631	55	2,919	67	2,600	50	3,393	145	2,955
Mexico	0	2,230	0	2,508	0	[4] 2,304	0	3,827	0	2,136
Rumania	1	1,871	0	0	2	1,480	0	1,549		
Australia [4]	1	1,545	0	1,841	0	1,996	2	2,530		
Belgium	33	1,319	47	1,313	11	1,143	22	1,671	13	1,211
Peru	0	1,272	0	1,667	0	1,528	0	1,188	15	
Bulgaria	0	1,227	0	598	0	483	0	507		496
Czechoslovakia	24	958	5	1,119	1	1,071	2	1,208	0	1,188
Sweden	4	454	4	453	2	601	3	840	29	656
Japan	0	330	0	[4] 322	0	[4] 349	0			
Philippine Islands	0	312	0	271	0	346	0	292	0	346
Netherlands	7	181	4	209	3	185	16	280	18	278
New Zealand	0	173	0	273	0	166	0	312	0	189
Denmark	6	154	7	116	6	194	[4] 5	[4] 341	3	264
Total	23,208	398,508	32,796	437,258	17,367	425,527	35,006	519,739	30,295	232,819

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] Preliminary.
[2] 2-year average.
[3] 4-year average.
[4] International Yearbook of Agricultural Statistics.

TABLE 207.—*Onions: United States imports, by countries, annual, 1922–23 to 1931–32*

Year beginning July	Netherlands	Spain	Italy	United Kingdom	Canada	Canary Islands	Bermuda	Mexico	Chile	Australia	Egypt	Other countries	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1922–23	33	990	11	157	42	13	18	20	1	3	447	48	1,783
1923–24	(1)	1,098	17	52	1	8	9	29	30	4	148	10	1,406
1924–25	60	1,090	19	71	29	7	9	18	79	8	618	67	2,075
1925–26	11	1,342	100	36	11	4	9	20	28	3	599	33	2,194
1926–27	48	1,084	65	59	9	2	9	1	76	8	912	25	2,298
1927–28	11	701	35	12	2	1	3	(1)	213	3	392	26	1,399
1928–29	580	1,007	145	26	4	2	(1)	11	134	4	105	32	2,050
1929–30	5	768	42	11	(1)	1	(1)	(1)	49	2	38	2	918
1930–31	0	177	24	1	2	0	(1)	0	10	0	0	0	214
1931–32	3	152	26	1	89	0	(1)	1	234	2	125	32	665

Bureau of Agricultural Economics. Compiled from official records of the Bureau of Foreign and Domestic Commerce.

[1] Less than 500 bushels.

TABLE 208.—*Onions, commercial crop: Acreage, production, and price per bushel by States, 1929–1932*

Group and State	Acreage				Production				Seasonal farm price to Dec. 1 per bushel			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Early (Bermuda and Creole):	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	3, 450	2, 050	1, 250	2, 450	869	570	339	[2] 620	1. 25	0. 98	0. 95	0. 65
Louisiana	2, 180	1, 260	1, 100	1, 200	277	77	94	90	1. 09	1. 16	1. 19	. 80
Texas	19, 700	16, 310	17, 200	21, 200	3, 763	3, 360	[2] 3, 457	4, 176	1. 02	. 70	. 73	1. 02
Total	25, 330	19, 620	19, 550	24, 850	4, 909	4, 007	[2] 3, 890	[2] 4, 886	1. 06	. 75	. 77	. 97
Intermediate (domestic):												
California	840	940	1, 100	2, 000	373	466	483	[2] 908	. 45	. 48	. 57	. 26
Iowa (Scott County district)	1, 000	1, 050	1, 050	1, 050	260	336	194	315	. 86	. 91	. 85	. 55
Kentucky	600	510	400	400	48	18	150	88	. 43	. 75	. 70	. 40
New Jersey	2, 000	2, 200	2, 400	3, 000	490	396	660	675	1. 20	1. 00	. 85	. 70
Texas (Collin County district)	1, 170	1, 350	1, 810	2, 600	302	279	452	650	1. 27	. 94	. 78	. 71
Virginia, Eastern Shore	700	560	560	520	119	56	84	52	1. 15	1. 00	. 70	. 50
Washington (Walla Walla County)	810	850	800	760	405	412	304	304	. 63	. 56	. 50	. 25
Total	7, 120	7, 460	8, 120	10, 330	1, 997	1, 963	2, 327	[2] 2, 992	. 89	. 76	. 72	. 51
Late (domestic):												
California	6, 040	6, 680	5, 300	5, 640	1, 727	[2] 2, 017	1, 463	[2] 1, 985	. 86	. 61	. 83	. 26
Colorado	7, 000	5, 600	4, 050	5, 670	[2] 2, 583	1, 725	923	[2] 1, 644	. 45	. 32	. 74	. 23
Idaho	*1, 000*	*1, 700*	*1, 500*	*1, 600*	475	629	825	[2] 720	. 50	. 30	. 90	. 24
Illinois	770	750	690	800	212	188	110	220	. 70	. 72	. 90	. 40
Indiana	8, 400	9, 120	7, 750	8, 580	2, 436	3, 493	1, 318	3, 089	. 56	. 37	. 70	. 17
Iowa (other)	1, 900	2, 000	1, 500	1, 400	627	680	262	[2] 406	. 60	. 48	. 90	. 20
Massachusetts	2, 950	2, 730	2, 520	2, 720	1, 136	1, 147	970	1, 197	. 85	. 63	. 90	. 34
Michigan	5, 700	6, 700	6, 900	8, 670	1, 653	2, 767	1, 311	3, 208	. 62	. 43	. 75	. 18
Minnesota	2, 160	2, 650	1, 900	2, 400	756	702	380	936	. 60	. 37	. 80	. 23
Nevada	150	130	180	200	32	43	36	80	. 64	. 42	. 84	. 20
New York	7, 910	8, 000	8, 200	8, 770	3, 243	3, 576	2, 780	3, 683	. 75	. 45	. 85	. 23
Ohio	6, 600	5, 400	5, 300	5, 140	1, 650	1, 404	874	1, 388	. 55	. 42	. 70	. 21
Oregon	1, 040	1, 080	1, 250	1, 300	406	486	600	572	. 60	. 32	. 85	. 30
Pennsylvania	340	350	350	400	94	86	91	100	. 90	. 70	. 90	. 45
Utah	1, 100	1, 200	800	1, 000	475	398	328	500	. 50	. 35	. 65	. 20
Washington (other)	850	950	900	1, 000	408	428	405	400	. 53	. 30	. 80	. 20
Wisconsin	980	940	870	1, 240	294	263	235	335	. 69	. 55	. 75	. 23
Total	54, 890	55, 980	49, 960	56, 530	[2] 18, 207	[2] 20, 032	12, 911	[2] 20, 463	. 64	. 44	. 80	. 22
Total, domestic	62, 010	63, 440	58, 080	66, 860	[2] 20, 204	[2] 21, 995	15, 238	[2] 23, 455	. 66	. 46	. 79	. 26
Grand total	87, 340	83, 060	77, 630	91, 710	[2] 25, 113	[2] 26, 002	[2] 19, 128	[2] 28, 341	. 74	. 51	. 79	. 39

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Bushels containing approximately 57 pounds.

[2] Includes some quantities not harvested on account of market conditions: 145,000 bushels in 1929, 75,000 bushels in 1930, 726,000 bushels in 1931, and 1,062,000 bushels in 1932. Price refers to harvested portion of crop.

TABLE 209.—*Onions: Car-lot shipments, by State of origin, 1921–22 to 1931–32*

State	Crop-movement season [1]										
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Massachusetts	2, 244	1, 912	2, 454	2, 481	2, 856	3, 586	2, 495	1, 416	1, 854	1, 474	1, 360
New York	2, 890	2, 812	5, 505	5, 335	5, 109	3, 720	4, 102	1, 807	3, 985	4, 226	3, 272
New Jersey	429	479	335	403	235	253	205	333	239	193	219
Ohio	1, 749	4, 493	2, 714	4, 492	1, 856	2, 287	4, 070	1, 774	2, 968	2, 293	1, 341
Indiana	1, 972	4, 684	4, 610	3, 735	4, 158	4, 493	5, 000	3, 939	5, 195	6, 870	2, 750
Illinois	251	467	378	241	291	158	142	180	142	193	69
Michigan	417	1, 867	1, 222	1, 623	1, 402	2, 171	2, 653	2, 004	2, 964	5, 499	2, 800
Wisconsin	90	330	273	212	361	270	279	294	241	219	199
Minnesota	160	500	189	487	674	684	1, 289	1, 077	1, 448	1, 141	740
Iowa	416	927	882	1, 176	1, 305	1, 434	1, 333	1, 430	1, 492	1, 762	789
Virginia	280	371	274	345	138	178	131	178	234	109	147
Kentucky	382	258	263	266	152	134	145	69	59	12	38
Texas	4, 209	4, 630	3, 027	3, 918	3, 941	5, 316	4, 028	7, 081	7, 232	6, 312	5, 718
Idaho	50	161	256	322	876	531	891	1, 152	731	677	1, 315
Colorado	447	651	928	1, 064	1, 809	1, 758	1, 460	2, 244	4, 042	2, 124	1, 482
Utah	54	170	177	216	599	662	654	1, 029	950	551	495
Washington	702	765	1, 126	1, 016	1, 000	1, 200	1, 302	1, 153	1, 417	1, 464	1, 200
Oregon	343	263	392	558	681	678	671	663	660	730	1, 062
California	3, 542	3, 631	4, 145	2, 671	3, 603	3, 013	3, 753	4, 492	4, 144	4, 062	3, 384
Other States	254	369	330	235	540	536	499	351	264	147	328
Total	20, 890	29, 760	29, 480	30, 796	31, 646	33, 062	35, 192	33, 326	40, 281	40, 067	28, 807

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from Mar. 1 of one year through June of the following year.
[2] Preliminary.

TABLE 210.—*Onions: Average l. c. l. price per 100 pounds to jobbers, at New York and Chicago, 1923–24 to 1932–33*

Market and crop season	Various common varieties								Bermuda varieties					
									April		May		June	
	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Yellow	Crystal white wax	Yellow	Crystal white wax	Yellow	Crystal white wax
New York:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	2. 68	3. 21	3. 26	2. 75	2. 76	2. 73	2. 33	2. 20	------	------	3. 27	------	------	------
1924–25	2. 17	1. 89	1. 84	2. 08	2. 84	3. 05	3. 05	2. 86	4. 19	5. 04	6. 16	5. 01	7. 18	------
1925–26	2. 94	2. 36	2. 86	2. 80	3. 26	2. 95	2. 69	2. 81	------	------	4. 37	------	3. 27	------
1926–27	2. 26	1. 59	1. 82	1. 92	2. 74	3. 08	2. 70	3. 46	5. 36	------	5. 64	------	6. 64	------
1927–28	2. 17	1. 72	1. 60	1. 72	2. 18	2. 60	2. 89	4. 25	5. 38	6. 17	3. 14	3. 33	2. 37	2. 00
1928–29	2. 62	3. 53	3. 62	4. 14	4. 42	4. 88	5. 42	4. 67	4. 47	------	3. 10	------	3. 50	------
1929–30	2. 31	2. 02	1. 91	1. 86	2. 28	2. 23	2. 37	2. 11	3. 40	4. 05	2. 60	------	2. 96	------
1930–31	*1. 88*	*1. 70*	*1. 53*	*1. 63*	*1. 55*	*1. 28*	*1. 32*	*1. 47*	------	------	------	------	*3. 20*	------
1931–32	2. 14	2. 55	2. 73	2. 97	3. 85	4. 58	4. 58	6. 38	[1] 6. 52	------	[1] 2. 78	[1] 2. 71	[1] 1. 69	------
1932–33	1. 17	1. 27	1. 41	1. 29	1. 26	------	------	------	------	------	------	------	------	------
Chicago:														
1923–24	3. 19	3. 48	3. 29	3. 22	3. 07	3. 27	3. 04	2. 79	5. 17	------	3. 37	4. 10	------	------
1924–25	3. 11	2. 73	2. 43	2. 52	2. 88	3. 96	3. 38	4. 32	4. 15	5. 46	6. 33	6. 75	7. 94	8. 39
1925–26	3. 41	2. 90	3. 11	3. 35	3. 46	3. 20	2. 81	3. 18	5. 60	5. 92	3. 97	4. 71	3. 21	3. 61
1926–27	2. 25	2. 07	1. 92	1. 69	2. 46	3. 31	3. 42	3. 92	5. 27	5. 96	5. 66	6. 15	5. 57	6. 07
1927–28	2. 57	1. 74	1. 68	1. 65	2. 02	2. 77	2. 78	4. 04	4. 57	5. 23	3. 04	3. 17	2. 31	2. 64
1928–29	2. 72	3. 35	3. 66	4. 22	4. 59	5. 27	5. 39	5. 26	4. 07	5. 22	3. 06	3. 33	3. 45	4. 42
1929–30	3. 08	2. 44	2. 12	2. 20	2. 29	2. 39	2. 18	1. 73	3. 87	4. 55	2. 78	3. 15	3. 02	3. 48
1930–31	[2] 2. 12	[2] 1. 80	[2] 1. 14	[2] . 89	1. 47	1. 51	1. 27	1. 60	------	------	3. 26	3. 71	2. 93	3. 14
1931–32	2. 43	2. 74	2. 94	2. 76	3. 57	4. 65	5. 14	6. 86	------	------	2. 42	2. 60	1. 68	1. 84
1932–33	1. 23	1. 29	1. 09	1. 00	1. 06	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

[1] No quotations for U. S. No. 1 grade; prices shown are for U. S. commercial grade which is not comparable with U. S. No. 1.
[2] Car-lot sales.

TABLE 211.—*Peaches: Total production, average price per bushel, and foreign trade of the United States, 1913–1932* [1]

Year	Production	Average price per bushel, crop-marketing season [3]	Farm value, basis average price, crop-marketing season	Domestic exports, year beginning July [2]			
				Fresh	Dried	Canned [4]	Total in terms of fresh
	1,000 bushels	*Dollars*	*1,000 dollars*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bushels*
1913	39,707				6,712		736
1914	54,109				14,465		1,586
1915	64,097				13,739		1,507
1916	37,505				8,188		898
1917	48,765				5,863		643
1918	33,094	1.62	53,637		4,835		530
1919	*50,686*						
1919	53,178	1.89	100,485		12,756		1,399
1920	45,620	2.10	95,970		3,573		392
1921	32,602	1.59	51,739	[5] 611	6,260		699
1922	55,852	1.34	74,717	13,170	5,586	54,624	3,163
1923	45,382	1.37	62,025	15,065	12,975	50,374	3,835
1924	*47,755*						
1924	53,848	1.26	68,084	16,172	4,668	57,390	3,240
1925	46,562	1.38	64,171	15,749	3,351	83,160	4,161
1926	[6] 69,865	1.00	68,426	14,453	6,968	81,896	4,477
1927	[6] 45,463	1.18	50,494	17,969	6,542	86,634	4,701
1928	[6] 68,369	.99	63,643	22,067	12,436	101,436	6,050
1929	*42,827*						
1929	44,977	1.33	59,652				
1930	[6] 54,199	.89	44,142	19,973	3,847	74,470	3,941
1931	[6] 76,586	.56	40,726	12,859	8,482	75,763	4,355
1932 [7]	[6] 46,267	.52	18,909	10,731	8,490	66,300	3,917

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board; italic figures are census returns. Prices based upon returns from crop reporters. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Dried peaches converted to terms of fresh on the basis that dried peaches equal 19 per cent of fresh. Canned peaches converted to terms of fresh on the basis that 24 pounds of fresh equal 1 dozen cans of 1 pound each; 48 pounds fresh equals 1 bushel. In practice, 1 bushel of fresh fruit is figured as the equivalent of 2 dozen cans of 1 pound each.

[2] Compiled from Commerce and Navigation of the United States, 1913–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926, January and June issues, 1927–1932.

[3] From 1918 to 1922, Sept. 15 price; 1923–1925, Sept. 15 price in North, Aug. 15 price in South; 1926–1932, average price for the crop-marketing season.

[4] *Canned peaches were reported in value only prior to July 1, 1922.*

[5] No exports reported prior to Jan. 1, 1922; figures for 1921 represent exports Jan. 1, 1922, to June 30, 1922.

[6] Includes fruit not harvested as follows: 1926, 1,462,000 bushels in Georgia and northern States; 1927, 2,708,000 bushels in California; 1928, 2,917,000 bushels in California and 1,000,000 bushels in Georgia; 1930, 16,818,000 bushels in California including 6,180,000 sold but left on the trees; 1931, 12,001,000 bushels in California including 3,938,000 sold but left on the trees; 1932, 10,168,000 bushels in California. Values are based on the quantity actually harvested plus a quantity of fruit that was sold but left on trees in 1930 and 1931.

[7] Preliminary.

TABLE 212.—*Peaches: Car-lot shipments, United States, by months, 1923–1932*

Year	Crop-movement season [1]						
	May	June	July	August	September	October [2]	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	1	2,384	10,963	9,757	9,654	766	33,525
1924	28	1,873	14,603	13,781	7,889	1,323	39,497
1925	328	4,951	17,932	9,921	7,420	306	40,858
1926	52	2,209	21,793	24,538	8,847	1,026	58,465
1927	267	5,638	12,675	13,217	9,739	178	41,714
1928	12	1,765	23,122	22,819	8,802	462	56,972
1929	106	2,374	10,429	14,012	8,308	222	35,451
1930	18	2,515	12,956	15,526	7,333	142	38,490
1931	47	2,045	15,765	23,782	4,283	148	46,070
1932 [3]		357	3,793	10,642	5,416	527	20,735

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included. See 1927 Yearbook, p. 855 for data for earlier years.

[1] Crop-movement season extends from May 1 through October of a given year.

[2] Figures include shipments in November as follows: 1924, 1 car; 1926, 5 cars; 1932, 3 cars.

[3] Preliminary.

TABLE 213.—*Peaches: Production and average price, by States, average 1924–1928 and annual 1929–1932*

State and division	Production					Average price per bushel, crop-marketing season			
	Average, 1924–1928	1929	1930	1931	1932[1]	1929	1930	1931	1932
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New Hampshire	23	16	23	24	20	2.00	2.00	1.55	1.50
Massachusetts	100	124	177	153	166	2.10	1.60	1.25	1.15
Rhode Island	29	27	31	40	44	2.50	1.80	1.40	1.15
Connecticut	222	146	249	210	215	2.00	1.30	1.40	.80
New York	1,988	1,045	1,717	1,860	1,663	1.60	1.15	.65	.60
New Jersey	2,234	1,990	1,360	2,230	1,776	1.15	1.70	.65	.70
Pennsylvania	1,525	1,234	1,020	2,660	1,676	1.75	1.70	.65	.80
North Atlantic	6,181	4,582	4,577	7,177	5,560	1.62	1.47	.69	.72
Ohio	1,418	478	350	2,220	814	1.95	1.90	.55	.90
Indiana	461	978	14	1,480	106	1.55	2.00	.55	1.00
Illinois	1,324	3,320	(2)	4,300	188	1.35	1.60	.50	1.20
Michigan	871	998	908	1,946	1,738	1.60	1.50	.60	.70
Iowa	45	77	9	112	76	1.50	1.70	.90	.90
Missouri	889	864	24	1,500	102	1.35	1.95	.65	1.20
Nebraska	35	52	25	50	58	1.65	1.85	1.05	.95
Kansas	242	250	35	330	50	1.55	1.75	.90	1.20
North Central	5,285	7,023	1,365	11,938	3,132	1.49	1.63	.57	.89
Delaware	278	401	190	500	227	1.10	1.60	.45	.60
Maryland	471	655	260	820	320	1.20	1.50	.60	.85
Virginia	864	1,058	260	1,600	306	1.00	1.60	.60	1.00
West Virginia	622	480	110	1,030	143	1.55	1.80	.55	1.15
North Carolina	2,028	1,400	1,700	3,128	1,645	1.40	1.35	.65	.95
South Carolina	914	690	1,200	1,840	792	1.35	1.35	.70	.95
Georgia	[3] 8,198	3,700	5,500	9,134	1,170	1.15	1.15	.55	.95
Florida	110	66	72	92	28	1.70	1.20	.95	.95
South Atlantic	13,486	8,459	9,292	18,144	4,631	1.22	1.25	.59	.94
Kentucky	829	530	70	1,280	79	1.45	1.70	.65	1.15
Tennessee	1,711	1,325	600	2,850	300	1.25	1.35	.50	1.00
Alabama	1,118	505	1,170	1,530	221	1.30	1.20	.65	.85
Mississippi	575	560	630	1,060	132	1.50	1.45	.75	.95
Arkansas	2,386	1,900	100	3,000	341	1.10	1.60	.55	1.05
Louisiana	206	195	142	310	96	1.70	1.75	1.05	1.05
Oklahoma	846	1,116	80	360	280	1.00	1.30	.90	.90
Texas	1,674	2,073	800	1,500	792	1.20	1.40	.90	.90
South Central	9,345	8,204	3,592	11,890	2,241	1.21	1.36	.64	.95
Idaho	180	183	15	170	178	1.30	2.00	.75	.45
Colorado	778	953	763	1,130	1,142	1.45	1.45	.50	.42
New Mexico	87	109	60	101	44	1.80	1.90	1.15	1.30
Arizona	63	68	90	85	83	1.80	1.80	1.45	1.50
Utah	515	604	370	550	748	1.00	1.35	.50	.34
Nevada	5	6	6	4	4	2.25	2.00	2.00	.75
Washington	854	1,225	600	1,050	1,320	1.35	1.35	.65	.35
Oregon	249	227	300	220	348	1.70	1.15	1.10	.60
California	[3] 19,793	13,334	[3] 33,169	[3] 24,127	[3] 26,836	1.30	.64	.43	.25
Clingstone [4]	[3] 11,693	7,459	[3] 22,585	[3] 16,543	[3] 17,835	1.58	.48	.39	.22
Freestone [5]	8,100	5,875	[3] 10,584	7,584	[3] 9,001	.95	.66	.50	.27
Western	[3] 22,524	16,709	[3] 35,373	[3] 27,437	[3] 30,703	1.31	.60	.46	.28
United States	[3] 56,821	44,077	[3] 54,199	[3] 76,586	[3] 46,267	1.33	.89	.56	.52

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Estimates of production for 1929 and 1930 revised on basis of 1930 Census. Earlier years not so revised.

[1] Preliminary.
[2] Crop failure.
[3] Includes some quantities not harvested on account of market conditions as follows: 1926, 1,462,000 bushels in Georgia and Northern States, 1928, 1,000,000 bushels in Georgia; California, 1927, clingstone, 2,708,000 bushels; 1928, clingstone, 2,917,000 bushels, 1930, clingstone, 16,318,000 bushels including 6,180,000 sold but left on the trees, freestone, 500,000 bushels; 1931, clingstone, 12,001,000 bushels including 3,938,000 sold but left on the trees; 1932, clingstone, 10,043,000 bushels, freestone, 125,000 bushels. Prices and value are computed on the quantity actually harvested plus a quantity of fruit that was sold but left on trees in 1930 and 1931.
[4] Mainly for canning.
[5] Mainly for drying.

TABLE 214.—*Peaches: Car-lot shipments, by State or origin, 1923–1932* [1]

State	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	2,777	3,436	3,055	2,367	1,159	1,744	865	2,310	958	1,957
New Jersey	1,790	1,461	1,047	1,145	1,069	41	544	24	88	46
Pennsylvania	615	448	204	828	514	806	732	330	658	579
Ohio	625	14	516	434	441	426	2	98	122	106
Indiana	236	25	18	416	245	398	676	(3)	533	-------
Illinois	390	860	579	3,010	1,591	1,975	4,637	(3)	5,307	46
Michigan	1,087	105	264	675	397	514	312	183	259	287
Missouri	1	217	14	34	14	2	56	-------	83	-------
Delaware	258	635	148	723	524	30	540	31	495	30
Maryland	804	637	70	652	366	291	495	83	149	56
Virginia	69	530	39	388	461	324	623	19	446	87
West Virginia	170	326	2	353	211	166	246	32	114	39
North Carolina	215	1,652	2,037	2,155	1,702	3,242	1,250	2,172	2,564	1,822
South Carolina	16	91	239	448	644	865	602	747	862	523
Georgia	8,701	13,611	13,513	17,963	11,882	15,926	5,298	8,623	13,589	2,024
Kentucky	1	17	6	69	43	87	60	-------	217	3
Tennessee	53	752	605	1,806	503	2,077	1,144	256	1,364	6
Alabama	1	132	224	375	11	325	81	42	232	-------
Mississippi	-------	7	32	88	-------	76	60	7	123	-------
Arkansas	724	2,785	2,300	2,529	1,780	4,010	2,679	41	4,187	230
Oklahoma	93	336	113	20	118	17	121	-------	4	3
Texas	102	763	1,070	964	49	278	569	21	143	20
Idaho	392	47	2	78	38	125	135	1	31	34
Colorado	1,254	1,772	834	1,271	1,709	1,117	1,765	1,369	1,507	1,742
Utah	1,203	1,109	94	774	798	694	550	341	221	459
Washington	1,645	412	991	1,419	248	1,741	1,554	609	912	890
Oregon	74	36	47	50	21	76	51	48	29	32
California	10,212	7,264	12,785	17,416	15,145	19,589	9,780	21,072	10,859	9,709
Other States	17	17	10	15	11	10	24	31	16	5

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included. See Table 213 for United States totals.

[1] Crop-movement season extends from May 1 through October of a given year. Figures for New York for 1924, 1926, and 1932 include shipments in November following the regular crop-movement season.
[2] Preliminary.
[3] No shipments because of frost killing.

TABLE 215.—*Peaches: Average l. c. l. price to jobbers, New York and Chicago, 1923–1932*

Market, and marketing season	6-basket carrier			Bushel basket				
	June	July	August	June	July	August	September	October
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York:								
1923	3.31	2.10	2.03	-------	2.18	2.16	2.48	1.94
1924	2.97	2.25	2.31	-------	1.74	2.18	2.09	2.46
1925	3.43	2.24	2.23	3.38	2.22	2.18	2.74	2.46
1926	3.14	1.79	1.28	3.05	1.74	1.48	1.26	1.17
1927	3.22	2.59	2.65	3.10	2.80	2.94	2.19	2.59
1928	3.48	2.17	1.62	3.61	2.01	1.69	2.05	1.74
1929	3.86	3.45	2.70	3.85	2.95	2.56	2.52	-------
1930	3.58	3.22	2.62	4.08	2.94	2.63	2.10	-------
1931	2.96	2.38	1.22	2.97	2.14	1.50	1.21	-------
1932	2.98	2.94	1.26	-------	2.81	1.46	1.39	.78
Chicago:								
1923	2.79	2.39	2.56	-------	2.76	3.06	2.11	2.25
1924	1.98	1.88	2.07	1.84	1.80	2.30	2.91	2.17
1925	3.11	2.35	3.01	3.08	2.45	3.16	2.72	2.38
1926	3.02	1.96	1.53	2.44	2.02	1.79	1.76	1.44
1927	2.30	2.32	-------	2.35	2.68	2.81	2.30	-------
1928	3.40	2.09	1.44	-------	2.18	1.94	2.15	2.11
1929	4.08	3.45	-------	-------	2.93	2.05	2.31	-------
1930	3.55	3.18	2.45	2.97	3.04	3.02	2.34	-------
1931	-------	2.03	1.27	-------	2.01	1.27	1.17	-------
1932	-------	3.02	1.57	-------	3.05	1.72	1.30	.95

Bureau of Agricultural Economics. Compiled from daily market reports from bureau respresentatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices.

TABLE 216.—*Pears: Total production, foreign trade of the United States, and average price per bushel, 1913–1932*

Year	Production	Average price per bushel, crop-marketing season [2]	Farm value, basis average price crop-marketing season	Domestic exports, year beginning July [1]: Fresh [3]	Canned [3]	Dried	Total in terms of fresh
	1,000 bushels	*Dollars*	*1,000 dollars*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bushels*
1913	10,108						
1914	12,086						
1915	11,216						
1916	11,874						
1917	13,281						
1918	13,362	1.38	18,419				
1919	*14,204*						
1919	15,006	1.84	27,614				
1920	16,805	1.66	27,865				
1921	11,297	1.71	19,268				
1922	20,705	1.06	21,943	30,785	49,358		2,823
1923	17,845	1.21	21,570	50,237	38,431		2,648
1924	18,868	1.42	26,689	41,452	53,851		3,107
1925	20,720	1.40	29,066	71,205	75,876		4,645
1926	25,249	.89	22,399	73,877	66,104		4,203
1927	18,373	1.32	24,298	51,056	52,671		3,258
1928	24,212	1.02	24,663	82,847	82,652	[4] 2,626	5,388
1929	*18,500*						
1929	21,138	1.43	30,152	62,024	54,709	3,655	3,876
1930	[5] 25,633	.75	18,292	134,670	74,355	8,037	6,574
1931	[5] 23,346	.60	13,667	90,702	71,570	6,079	5,378
1932 [6]	[5] 21,981	.39	7,635				

Bureau of Agricultural Economics. Production figures are estimates of the Crop Reporting Board: Italic figures are census returns. Prices are based upon returns from crop reporters. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Canned pears converted to terms of fresh on the basis that 1 pound canned fruit is equivalent to 2 pounds fresh; dried pears converted to terms of fresh on the basis that dried pears equal 25 per cent of fresh; 48 pounds fresh equals 1 bushel. No imports of pears reported.
[2] From 1918 to 1925, Nov. 15 price; 1926 to 1932, average price for the crop-marketing season.
[3] Exports were reported in value only, prior to July 1, 1922.
[4] January–June, 1929. Not previously reported.
[5] Includes some quantities not harvested on account of market conditions as follows: 1,292,000 bushels in 1930, 625,000 in 1931, and 2,500,000 in 1932. Prices and value are computed on harvested crop.
[6] Preliminary.

TABLE 217.—*Pears: Car-lot shipments, by State of origin, 1922–23 to 1931–32*

State	Crop-movement season [1]: 1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	5,461	1,701	2,978	4,510	2,263	1,694	1,590	547	2,661	831
New Jersey	40	76	60	52	47	19	16	4	19	2
Ohio	96	33	47	62	100	130	104	33	77	26
Illinois	468	318	595	614	858	228	370	787	154	1,058
Michigan	1,860	543	394	151	457	536	449	147	469	131
Delaware	151	541	273	128	249	49	1	20	13	7
Maryland	36	63	30	29	33	32	27	42	9	14
Alabama	79	60	27	66	12	93	71	152	135	46
Texas	50	99	129	121	144	213	39	231	100	105
Colorado	774	696	955	717	750	737	264	1,082	249	397
Utah	82	65	81	29	77	34	49	47	38	1
Washington	2,678	4,274	2,456	3,560	5,278	2,589	5,868	4,035	6,157	4,660
Oregon	1,862	2,575	1,483	2,225	2,909	2,977	4,437	4,211	5,123	2,824
California	6,465	7,143	6,312	8,718	11,673	9,215	11,003	9,465	13,490	9,804
Other States	279	402	426	275	359	198	146	344	133	154
Total	20,381	18,589	16,246	21,257	25,209	18,744	24,434	21,147	28,827	20,060

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop movement season extends from June of one year through May of the following year. Figures for California for 1930–31 and 1931–32 include shipments in month preceding and following the regular crop-movement season.
[2] Preliminary.

TABLE 218.—*Pears: Production and average price, by States, average 1924–1928, and annual 1929–1932*

State and division	Production					Average price per bushel, crop-marketing season			
	Average, 1924–1928	1929	1930	1931	1932 [1]	1929	1930	1931	1932
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	11	16	12	12	12	1.85	1.70	1.30	1.00
New Hampshire	14	13	12	12	12	1.60	1.50	1.40	.95
Vermont	10	12	8	10	11	1.95	1.60	1.50	1.05
Massachusetts	74	55	71	44	63	1.80	1.20	1.30	.85
Rhode Island	11	8	9	7	10	2.00	1.25	1.30	1.00
Connecticut	55	22	29	18	28	2.00	1.15	1.60	.85
New York	2,181	701	1,890	800	1,745	1.85	.90	.90	.46
New Jersey	541	72	104	96	112	1.60	.90	.65	.60
Pennsylvania	573	195	445	470	384	1.55	1.10	.65	.65
North Atlantic	3,469	1,094	2,580	1,469	2,377	1.78	.96	.84	.52
Ohio	351	204	273	505	313	1.40	1.15	.50	.60
Indiana	229	185	128	264	80	.85	.90	.40	.60
Illinois	542	600	265	760	64	.90	.95	.45	.75
Michigan	734	345	655	484	687	1.35	1.05	.65	.45
Iowa	48	93	59	94	78	1.35	1.45	.90	.75
Missouri	326	447	172	500	51	.95	1.10	.55	.85
Nebraska	25	53	36	35	38	1.50	1.55	1.00	.95
Kansas	184	256	118	220	35	1.10	1.15	.65	.95
North Central	2,446	2,183	1,706	2,862	1,346	1.08	1.08	.54	.57
Delaware	226	33	19	38	35	.50	.55	.40	.35
Maryland	279	113	81	149	92	.80	.85	.45	.55
Virginia	267	402	100	510	83	.90	1.35	.50	.75
West Virginia	59	65	24	129	23	1.40	1.70	.70	.90
North Carolina	207	196	122	340	99	1.20	1.30	.70	.85
South Carolina	107	89	88	119	54	1.25	1.15	.75	.80
Georgia	190	152	155	204	106	1.05	1.05	.70	.65
Florida	54	45	49	59	44	1.05	1.05	.70	.50
South Atlantic	1,398	1,095	638	1,548	536	1.02	1.14	.61	.68
Kentucky	99	256	57	320	37	1.00	1.35	.50	.90
Tennessee	209	276	150	335	59	1.05	1.15	.55	.85
Alabama	182	225	315	300	132	1.15	1.00	.65	.65
Mississippi	176	171	210	260	107	1.05	.95	.60	.50
Arkansas	100	149	90	200	34	1.20	1.30	.55	.75
Louisiana	66	64	60	80	48	1.35	1.30	.90	.70
Oklahoma	133	311	95	91	46	1.05	1.20	.90	1.00
Texas	437	510	355	383	182	1.00	1.10	.80	.80
South Central	1,401	1,962	1,332	2,029	645	1.06	1.10	.64	.74
Idaho	59	69	73	58	60	1.70	1.30	1.10	.60
Colorado	458	600	200	525	429	1.50	1.30	.60	.40
New Mexico	38	58	27	55	44	1.40	1.45	.80	.95
Arizona	13	16	14	18	15	2.45	2.10	1.35	.90
Utah	64	79	95	49	76	1.50	1.25	1.20	.75
Nevada	5	3	6	4	5	2.55	2.20	2.00	.85
Washington	2,528	3,322	4,463	3,650	3,723	1.35	.75	.50	.30
Oregon	1,885	2,750	3,165	1,995	2,808	1.40	.75	.70	.40
California	7,721	7,917	[2] 11,334	[2] 9,084	[2] 9,917	1.65	.55	.58	.30
Western	12,770	14,804	[2] 19,377	[2] 15,438	[2] 17,077	1.53	.65	.58	.33
United States	21,484	21,138	[2] 25,633	[2] 23,346	[2] 21,981	1.43	.75	.60	.39

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Estimates of production for 1929 and 1930 revised on basis of 1930 census. Earlier years not so revised.

[1] Preliminary.

[2] Includes some quantities not harvested on account of market conditions as follows: 1930, 1,292,000 bushels; 1931, 625,000 bushels; 1932, 2,500,000 bushels. Prices and value are computed on harvested crop.

TABLE 219.—*Peas, green, commercial crop: Acreage, production, and price per bushel or per pound, 1929–1932*

Utilization and State	Acreage				Production				Seasonal farm price			
	1929	*1930*	*1931*	*1932*	*1929*	*1930*	*1931*	*1932*	*1929*	*1930*	*1931*	*1932*
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market	65,550	80,200	82,270	111,090	5,485	6,641	5,869	[2] 6,981	1.67	1.44	1.48	1.20
					1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
For manufacture:[3]												
Maine	1,150	1,330	1,470	1,340	1,840	2,992	2,102	2,412	3.5	3.5	2.8	2.3
New York	32,800	34,440	31,900	24,700	39,360	75,768	41,151	24,700	3.0	3.1	2.8	2.2
New Jersey	400	600	500	500	800	300	715	120	3.5	3.5	3.0	2.8
Pennsylvania	1,730	2,010	1,920	1,800	4,325	1,809	2,918	3,060	3.0	3.0	2.7	2.2
Ohio	5,030	5,410	5,800	3,300	7,545	4,598	8,932	2,805	2.4	2.2	2.2	1.8
Indiana	5,500	6,270	5,950	5,400	9,350	13,857	15,827	9,072	2.6	2.6	2.4	1.6
Illinois	11,010	14,500	13,100	15,400	18,056	31,900	21,877	24,640	2.5	3.0	2.9	2.2
Michigan	10,900	11,660	10,200	9,400	13,625	22,037	10,812	7,332	2.4	2.6	2.5	1.8
Wisconsin	111,000	127,000	98,000	75,000	205,350	229,870	107,800	71,250	3.0	2.9	2.8	2.3
Minnesota	12,670	17,900	16,600	15,800	21,184	30,967	14,520	24,016	2.7	2.7	2.7	2.1
Delaware	3,040	3,200	2,620	1,550	6,536	1,056	4,795	852	3.0	3.0	3.0	2.3
Maryland	12,400	14,000	14,400	11,550	27,900	7,420	23,616	13,860	3.0	3.0	2.8	2.3
Montana	3,900	3,500	2,400	2,300	7,800	8,190	6,000	5,520	2.5	2.3	2.0	1.8
Colorado	3,400	3,700	3,500	2,770	6,038	6,734	5,180	3,407	2.2	2.3	2.3	1.8
Utah	11,670	13,070	7,200	6,300	26,316	35,942	14,688	13,734	2.8	2.8	2.6	2.3
Washington	1,940	2,100	2,300	2,600	4,268	5,250	2,760	6,916	3.0	3.0	2.5	2.1
Other States[4]	4,380	6,050	5,590	6,890	7,310	10,243	11,074	14,855	3.0	2.9	2.9	2.2
Total for manufacture	232,920	266,740	223,350	186,600	407,603	488,933	294,767	228,551	2.9	2.9	2.7	2.2

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 32 pounds, unshelled.
[2] Includes some quantities not harvested on account of market conditions, 110,000 bushels in 1932. Price refers to harvested portion of crop.
[3] Reported on shelled basis.
[4] Other States include California, Idaho, Iowa, Kansas, Tennessee, Virginia, and Wyoming.

TABLE 220.—*Peas, green: Car-lot shipments, by State of origin, 1925–1932* [1]

State	1925	1926	1927	1928	1929	1930	1931	1932[2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	885	1,110	975	837	731	892	431	351
New Jersey	20	27	40	38	28	1	13	1
Maryland	48	55	54	68	62	2	13	-------
Virginia	303	288	269	281	222	129	232	75
North Carolina	491	596	570	685	368	482	554	284
South Carolina	104	167	207	247	244	265	256	71
Florida	5	-------	9	14	31	6	130	146
Mississippi	149	233	243	250	199	234	282	46
Idaho	13	40	101	176	238	407	415	342
Colorado	35	68	149	348	459	463	559	691
Washington	43	64	111	152	334	791	539	829
California	569	803	1,361	1,642	2,205	3,494	3,016	4,870
Other States	42	127	100	63	77	128	120	217
Total	2,707	3,568	4,179	4,801	5,188	7,294	6,560	7,823

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season is for calendar year, except Florida and Texas, which begin in October of the preceding year.
[2] Preliminary.

TABLE 221.—*Peas, canned: Pack*[1] *in the United States, 1919–1932*

State	Season													
	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
New York	1,040	2,381	1,382	2,137	2,541	2,931	2,385	2,624	1,668	2,222	1,683	3,164	1,786	1,021
New Jersey [2]	248	549	345	153	199	331	257	143	267	242	383	74	298	49
Ohio	306	282	241	225	384	430	232	278	205	336	337	208	398	131
Indiana	381	271	182	268	367	483	86	500	90	427	404	564	711	412
Illinois	433	460	331	516	586	697	357	680	563	617	767	1,560	1,003	1,149
Michigan	425	549	317	455	392	710	451	723	399	542	558	880	434	291
Wisconsin	4,317	5,804	4,063	7,042	6,961	10,390	10,003	9,287	6,549	9,248	9,399	10,492	5,057	3,346
Minnesota [3]	-----	-----	-----	-----	254	470	432	446	497	722	926	1,333	617	1,161
Maryland	509	696	533	489	591	873	956	840	986	1,030	1,469	400	1,243	689
Utah	395	595	376	751	918	830	1,346	1,029	802	1,154	1,241	1,662	676	752
California	205	328	84	496	239	282	271	222	(4)	(4)	(4)	(4)	(4)	(4)
Other States	426	402	353	510	516	888	1,040	937	910	1,403	1,363	1,698	1,063	1,366
United States	8,685	12,317	8,207	13,042	13,948	19,315	17,816	17,709	12,936	17,943	18,530	22,035	13,286	10,367

Bureau of Agricultural Economics. Compiled from National Canners' Association, 1919–1926; Bureau of Census, 1927–1929; beginning 1930, Foodstuffs, Division Bureau of Foreign and Domestic Commerce.

[1] Stated in cases of 24 No. 2 cans.
[2] Includes Delaware.
[3] Previous to 1923, included in "Other States."
[4] Included in "Other States."

TABLE 222.—*Pecans: Estimated production and December 1 price, by States, average 1924–1928 and annual 1929–1932*

State	Production														
	Improved varieties					Seedling varieties					Total				
	Average, 1924–1928	1929	1930	1931	1932[1]	Average, 1924–1928	1929	1930	1931	1932[1]	Average, 1924–1928	1929	1930	1931	1932[1]
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Ill	0	0	0	0	0	132	150	200	250	175	132	150	200	250	175
Mo	7	15	10	35	20	653	885	590	1,765	1,230	660	900	600	1,800	1,250
N. C	354	430	420	735	430	250	234	220	315	145	604	664	640	1,050	575
S. C	574	450	750	800	640	246	130	170	150	110	820	580	920	950	750
Ga	5,560	3,600	4,300	8,832	2,390	1,000	400	400	768	210	6,560	4,000	4,700	9,600	2,600
Fla	1,062	750	900	1,880	345	513	250	250	470	280	1,575	1,000	1,150	2,350	625
Ala	1,772	1,340	2,330	3,520	1,230	577	280	400	480	170	2,349	1,620	2,730	4,000	1,400
Miss	2,154	1,200	2,450	3,000	815	2,291	1,100	3,250	2,500	1,220	4,445	2,300	5,700	5,500	2,035
Ark	62	60	80	170	60	1,702	940	1,420	2,630	1,490	1,764	1,000	1,500	2,800	1,550
La	600	375	1,200	960	550	3,606	2,125	6,800	5,040	3,150	4,206	2,500	8,000	6,000	3,700
Okla	61	70	70	115	190	12,479	14,830	12,930	11,385	18,810	12,540	14,900	13,000	11,500	19,000
Tex	417	550	300	960	550	20,683	19,450	12,200	31,040	18,950	21,100	20,000	12,500	32,000	19,500
U. S	12,623	8,840	12,810	21,007	7,220	44,132	40,774	38,830	56,793	45,940	56,755	49,614	51,640	77,800	53,160

ESTIMATED PRICE PER POUND RECEIVED BY PRODUCERS DECEMBER 1

State		*Cents*	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*
Ill	-----	-----	-----	-----	-----	-----	15.0	14.0	8.0	7.0	-----	15.0	14.0	8.0	7.0
Mo	-----	30.0	20.0	15.0	12.0	-----	13.0	12.0	8.0	6.0	-----	13.2	12.2	8.1	6.1
N. C	-----	34.0	33.0	20.0	17.0	-----	20.0	18.0	14.0	11.0	-----	29.1	28.0	18.2	15.5
S. C	-----	35.0	28.0	17.0	14.0	-----	20.0	18.0	11.0	9.5	-----	31.7	26.2	16.0	13.3
Ga	-----	31.0	30.0	12.0	13.0	-----	15.0	14.0	6.0	6.2	-----	29.4	28.6	11.5	12.5
Fla	-----	33.0	29.0	14.0	14.0	-----	17.0	17.0	8.0	8.0	-----	29.0	26.3	12.8	11.2
Ala	-----	30.0	25.0	14.0	13.0	-----	16.0	12.0	8.0	6.5	-----	27.6	23.1	13.3	12.2
Miss	-----	32.0	27.0	14.0	14.5	-----	17.0	12.0	7.0	7.5	-----	24.8	18.5	10.8	10.3
Ark	-----	35.0	30.0	15.0	14.0	-----	12.0	12.0	6.0	6.5	-----	13.4	12.9	6.6	6.8
La	-----	31.0	24.0	16.0	13.0	-----	15.0	12.0	7.5	7.0	-----	17.4	13.8	8.9	7.9
Okla	-----	39.0	30.5	19.0	13.0	-----	10.2	9.1	5.0	3.5	-----	10.3	9.2	5.1	3.6
Tex	-----	32.0	27.0	17.0	13.0	-----	11.0	11.0	5.3	4.0	-----	11.6	11.4	5.6	4.3
U. S	-----	31.7	27.8	13.8	13.6	-----	11.4	10.8	5.8	4.3	-----	15.0	15.0	7.9	8.6

TABLE 223.—*Peppers, commercial crop for market: Acreage, production, and price per bushel, 1929–1932*

Marketing season	Acreage				Production				Seasonal farm price per bushel			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall	450	650	2,400	1,650	81	208	504	396	4.45	2.44	.76	1.00
Early	5,200	5,900	5,800	6,400	1,481	1,285	1,365	1,385	1.43	1.63	1.36	1.00
Second early	2,020	2,270	1,820	1,460	382	282	361	200	.94	.74	.65	.93
Intermediate	6,630	6,350	6,700	5,900	1,238	1,505	2,000	1,413	.66	.52	.34	.38
Late	1,060	2,040	1,730	1,760	229	400	348	434	.93	.78	.68	.52
Total	*15,380*	*17,210*	*18,450*	*17,170*	*3,411*	*3,680*	*4,578*	*3,828*	*1.13*	*1.06*	*.74*	*.71*

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] *Bushels containing approximately 22 pounds.*

TABLE 224.—*Plums and prunes: Production and average price per ton, by States, average 1924–1928 and annual 1929–1932*

Crop and State	Production					Average price per ton, crop marketing season			
	Average, 1924–1928	1929	1930	1931	1932[1]	1929	1930	1931	1932
Plums and fresh prunes:	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
California	50,800	40,000	82,000	[2] 65,000	[2] 68,000	90.00	35.00	24.00	17.00
Idaho	16,980	25,000	22,000	19,500	26,000	22.00	23.00	21.00	6.50
Oregon	16,500	28,500	25,000	21,500	36,000	24.50	20.00	20.00	6.50
Washington	11,320	23,750	18,875	10,850	23,100	22.50	22.00	20.00	7.50
Total	101,600	117,250	147,875	[2] 116,850	[2] 153,100	45.90	29.02	22.29	10.96
Prunes, dried: [3]									
California	176,000	103,000	[2] 274,000	208,000	[2] 181,000	155.00	55.00	58.00	52.00
Oregon	17,000	50,000	[2] 25,500	27,000	20,000	140.00	70.00	75.00	52.00
Washington	3,570	7,500	3,750	3,757	2,500	140.00	70.00	75.00	50.00
Idaho		880	215			130.00	65.00		
Total	196,570	161,380	[2] 303,465	238,757	[2] 203,500	149.52	56.13	60.19	51.97

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.
[2] *Includes some quantities not harvested on account of market conditions as follows:* Plums, *California*, 1931, 7,000 tons; 1932, 9,000 tons; prunes, dried, California, 1930, 13,000 tons, 1932, 4,000 tons; Oregon, 1930, 8,000 *tons. Prices and value are computed on the harvested crop.*
[3] To convert California estimates to fresh fruit basis, multiply by 2½. In other States the ratio ranges from 3 to 4 fresh to 1 dried.

TABLE 225.—*Potatoes: Acreage, production, value, exports, etc., United States 1909–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Wholesale price per bushel at New York [1]	Domestic exports, year beginning July [2]	Imports, year beginning July [2]	Net balance, year beginning July [2,3]
	1,000 acres	*Bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1909	*3,669*	*106.1*	*389,195*						
1909	3,669	107.5	394,552	54.2	213,679	49	999	353	+646
1910	3,720	93.8	349,032	55.7	194,566	54	2,384	219	+2,177
1911	3,619	80.9	292,737	79.9	233,778	106	1,237	13,735	−12,283
1912	3,711	113.4	420,647	50.5	212,550	62	2,028	337	+1,693
1913	3,668	90.4	331,525	68.7	227,903	78	1,794	3,646	−1,823
1914	3,711	110.5	409,921	48.7	199,460	47	3,135	271	+2,866
1915	3,734	96.3	359,721	61.7	221,992	103	4,018	210	+3,810
1916	3,565	80.5	286,953	146.1	419,333	238	2,489	3,079	−558
1917	4,384	100.8	442,108	122.8	542,774	129	3,453	1,180	+2,273
1918	4,295	95.9	411,860	119.3	491,527	127	3,689	3,534	+205
1919	*3,252*	*89.3*	*290,428*						
1919	3,295	90.7	298,975	158.0	472,289	284	3,723	6,941	−3,212
1920	3,302	112.5	371,356	112.8	418,926	103	4,803	3,423	+1,399
1921	3,598	91.0	327,365	108.1	353,803	123	2,327	2,110	+222
1922	3,943	106.4	419,655	55.7	233,909	97	2,980	572	+2,408
1923	3,384	108.6	367,534	75.7	278,251	118	3,075	564	+2,512
1924	*2,911*	*121.1*	*352,462*						
1924	3,111	124.1	386,219	62.3	240,757	78	3,653	478	+3,187
1925	2,825	105.9	299,072	187.2	559,939	238	1,824	5,420	−3,575
1926	2,817	114.7	323,085	[4] 141.3	456,601	161	2,092	6,349	−4,205
1927	3,177	116.6	370,423	[4] 95.1	352,376	129	2,424	3,803	−1,313
1928	3,474	122.8	426,776	[4] 52.7	224,859	76	3,165	2,698	+528
1929	*2,944*	*109.5*	*322,416*						
1929	2,978	110.5	329,134	[5] 131.6	[6] 433,151	163	2,386	6,006	−3,521
1930	3,038	109.9	333,936	[5] 91.5	[6] 305,401	111	1,548	5,729	−4,155
1931	3,375	111.2	375,310	[5] 46.3	[6] 173,767	61	816	1,476	−568
1932 [7]	3,368	105.9	356,589	[5] 38.6	[6] 136,922				

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. Prices received by producers are based upon returns from crop reporters. See 1927 Yearbook, p. 881, for data for earlier years.

[1] Compiled from Producers Price Current. Prices 1909–1919 are averages of the high and low weekly quotations of New York potatoes, October–June, converted from dollars per 180 pounds to cents per bushel; beginning 1920, season September–May.

[2] Compiled from Commerce and Navigation of the United States, 1909–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926, January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.

[3] The difference between total exports (domestic exports plus reexports) and total imports; + indicates net exports and − indicates net imports.

[4] For some of the early and midseason States prices represent approximate seasonal average.

[5] Weighted average price for crop marketing season.

[6] Based on weighted average price for crop marketing season.

[7] Preliminary.

TABLE 226.—*Potatoes:* [1] *Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State and group	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932 [2]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [2]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Surplus late States:											
Maine	148	195	168	248	258	235	37,684	50,310	39,480	25	25
New York	245	202	210	114	142	135	28,363	28,684	28,350	47	41
Pennsylvania	200	191	195	106	139	110	22,872	26,549	21,450	53	47
Total	593	588	573	140.8	179.5	155.8	88,918	105,543	89,280	38.0	35.4

[1] Acreage and production estimates for each State cover the entire crop, whether commercial or noncommercial, early or late.

[2] Preliminary.

TABLE 226.—*Potatoes: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*—Continued

State and group	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
Michigan	243	250	260	104	95	115	26,510	23,750	29,900	31	26
Wisconsin	240	268	260	104	93	87	26,308	24,924	22,620	35	23
Minnesota	321	361	372	96	80	78	33,855	28,880	29,016	34	22
North Dakota	96	121	161	82	74	58	8,422	8,954	9,338	33	21
South Dakota	52	54	73	81	40	70	4,594	2,160	5,110	57	25
Total	951	1,054	1,126	97.4	84.1	85.2	99,688	88,668	95,984	33.9	23.6
Nebraska	95	131	135	80	55	65	7,969	7,205	8,775	57	32
Montana	22	19	22	107	85	102	2,343	1,615	2,244	56	41
Idaho	84	110	99	187	220	200	16,503	24,200	19,800	28	23
Wyoming	15	31	33	103	95	50	1,686	2,945	1,650	49	30
Colorado	85	101	100	145	95	110	13,511	9,595	11,000	33	25
Utah	13	15	15	150	130	150	1,832	1,950	2,250	49	36
Nevada	5	3	2	145	87	150	684	261	300	78	49
Washington	53	44	40	161	155	160	9,144	6,820	6,400	48	38
Oregon	37	42	42	108	130	120	4,108	5,460	5,040	43	41
California	46	37	33	161	195	193	8,056	7,215	6,369	75	53
Total	455	533	521	134.8	126.2	122.5	65,835	67,266	63,828	42.5	31.9
Total surplus late	1,999	2,175	2,220	118.2	120.2	112.2	254,442	261,477	249,092	37.8	30.0
Other late States:											
New Hampshire	10	9	8	120	165	165	1,278	1,485	1,320	61	52
Vermont	19	17	16	120	150	145	2,254	2,550	2,320	48	46
Massachusetts	14	13	13	110	125	150	1,501	1,625	1,950	84	65
Rhode Island	2	2	2	116	150	160	244	300	320	91	74
Connecticut	14	12	12	111	160	165	1,554	1,920	1,980	70	62
Total	58	53	51	114.0	148.7	154.7	6,831	7,880	7,890	64.9	56.9
West Virginia	36	40	41	97	80	88	3,540	3,200	3,608	81	66
Ohio	108	110	117	88	102	99	10,285	11,220	11,583	62	48
Indiana	49	58	61	81	85	90	4,536	4,930	5,490	59	46
Illinois	53	50	54	76	85	90	4,765	4,250	4,860	72	61
Iowa	78	70	73	87	55	110	7,588	3,850	8,030	75	37
Total	324	328	346	85.4	83.7	97.0	30,714	27,450	33,571	67.0	48.9
New Mexico	3	5	6	56	77	85	190	385	510	107	58
Arizona	3	3	3	74	85	90	219	255	270	119	91
Total	6	8	9	66.4	80.0	86.7	409	640	780	111.7	69.5
Total other late	388	389	406	89.8	92.5	104.0	37,954	35,970	42,241	67.4	50.7
Intermediate States:											
New Jersey	53	41	45	136	191	159	7,475	7,831	7,155	60	49
Delaware	5	5	6	87	108	86	471	540	516	59	56
Maryland	35	32	31	103	105	95	3,664	3,360	2,945	51	55
Virginia	115	118	94	121	121	103	15,357	14,278	9,682	55	63
Kentucky	48	55	60	83	72	77	4,442	3,960	4,620	76	67
Missouri	54	51	52	80	77	100	4,776	3,927	5,200	72	51
Kansas	48	46	44	88	79	117	4,931	3,634	5,148	62	39
Total	358	348	332	106.2	107.8	106.2	41,116	37,530	35,266	60.4	54.6
Early States:											
North Carolina	61	79	68	94	108	97	6,136	8,532	6,596	56	68
South Carolina	26	25	17	115	140	86	3,019	3,500	1,462	68	83
Georgia	12	18	17	65	66	59	761	1,188	1,003	75	86
Florida	27	28	23	105	130	67	3,056	3,640	1,541	108	104
Tennessee	38	57	53	73	59	69	2,897	3,363	3,657	86	72
Alabama	26	39	36	74	94	69	1,925	3,666	2,484	69	84
Mississippi	9	14	14	71	79	70	603	1,106	980	74	74
Arkansas	30	43	37	69	85	71	2,053	3,655	2,627	52	64
Louisiana	32	48	41	59	74	58	1,900	3,552	2,378	51	77
Oklahoma	39	45	42	71	72	74	2,875	3,240	3,108	59	53
Texas	36	67	62	63	73	67	2,379	4,891	4,154	86	88
Total	336	463	410	79.0	87.1	73.1	27,603	40,333	29,990	69.5	73.7
United States	3,081	3,375	3,368	109.3	111.2	105.9	361,115	375,310	356,589	46.3	38.[illegible]
30 late States	2,387	2,564	2,626	113.5	116.0	110.9	292,396	297,447	291,333	41.4	33.[illegible]
37 late and intermediate	2,745	2,912	2,958	112.5	115.0	110.4	333,512	334,977	326,599	43.5	35.3

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

Table 227.—*Potatoes, early commercial crop: Acreage, production, and price per bushel, by States, 1929–1932*

Group and State	Acreage				Production				Seasonal farm price per bushel			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall: Texas	800	600	3,000	4,200	40	51	210	189	1.05	1.80	1.05	0.75
Early (sec. 1):												
Florida	22,000	31,000	27,000	21,500	2,584	2,489	3,567	1,443	1.81	1.86	1.07	1.28
Texas, lower Rio Grande Valley	9,800	15,000	13,700	10,400	980	1,530	1,000	728	1.65	1.75	1.31	1.26
Total	31,800	46,000	40,700	31,900	3,564	4,019	4,567	2,171	1.76	1.82	1.11	1.28
Early (sec. 2):												
Alabama	7,500	11,800	14,600	10,000	668	1,180	2,044	850	1.45	1.45	.48	.72
California	10,300	11,300	15,700	13,600	1,339	2,090	2,590	2,380	1.22	1.20	.87	.66
Georgia	1,200	2,200	2,500	1,300	161	330	450	130	1.35	1.40	.65	.80
Louisiana	15,000	22,000	31,000	20,000	945	1,540	2,542	1,300	1.50	1.35	.50	.70
Mississippi	700	900	1,900	1,500	61	66	205	114	1.45	1.53	.47	.70
South Carolina	15,000	16,600	17,700	9,000	2,175	2,523	2,920	963	1.30	1.28	.67	.73
Texas, other	9,000	16,000	19,300	16,800	522	1,429	1,760	1,260	1.30	1.27	.63	.72
Total	58,700	80,800	102,700	72,200	5,871	9,158	12,511	6,997	1.33	1.30	.64	.70
Second early:												
Arkansas	3,400	4,700	6,500	5,100	323	494	552	434	1.00	1.15	.45	.48
North Carolina	27,500	31,500	33,500	23,500	3,438	4,347	5,192	3,642	1.00	1.30	.52	.54
Oklahoma	12,000	11,000	11,800	8,300	1,080	1,408	1,003	946	.95	1.10	.50	.46
Tennessee	1,500	1,700	2,200	1,500	156	136	99	105	1.16	1.20	.65	.55
Total	44,400	48,900	54,000	38,400	4,997	6,385	6,846	5,127	.99	1.24	.51	.59
Intermediate (sec. 1):												
Kansas	15,800	15,700	16,400	15,800	1,965	2,796	2,150	2,394	1.11	.71	.51	.20
Kentucky	4,300	5,300	5,200	5,000	722	344	408	625	1.35	.90	.59	.35
Maryland	9,000	10,400	9,000	7,200	1,440	1,290	1,170	1,008	1.20	.85	.48	.47
Missouri	4,600	5,100	5,300	5,800	552	1,046	716	1,160	1.10	.80	.63	.36
Virginia	68,600	81,700	76,900	58,000	11,938	12,255	10,639	7,364	1.16	.97	.54	.58
Total	102,300	118,200	112,800	91,800	16,617	17,731	15,143	12,551	1.16	.91	.54	.47
Intermediate (sec. 2):												
Nebraska	1,800	1,600	1,600	2,000	270	280	416	520	1.20	1.10	.70	.25
New Jersey	29,000	29,000	32,000	36,000	3,915	6,235	6,400	5,940	1.60	.88	.60	.48
Total	30,800	30,600	33,600	38,000	4,185	6,515	6,816	6,460	1.57	.89	.61	.46
Grand total	268,800	325,100	346,800	276,500	35,274	43,859	46,093	33,495	1.28	1.12	.63	.59

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Bushels containing approximately 60 pounds.

TABLE 228.—*Potatoes: Acreage, yield per acre, and production in specified countries; average, 1925–26 to 1929–30; annual, 1931–32 and 1932–33*

Country	Acreage			Yield per acre			Production		
	Average, 1925–26 to 1929–30	1931–32	1932–33[1]	Average, 1925–26 to 1929–30	1931–32	1932–33[1]	Average, 1925–26 to 1929–30	1931–32	1932–33[1]
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
North America:									
Canada	*552*	*584*	*522*	*135.1*	*149.3*	*125.8*	*74,579*	*87,175*	*65,093*
United States	3,054	3,375	3,368	114.5	111.2	105.9	349,698	375,310	356,589
Total	3,606	3,959	3,890	117.7	116.8	108.6	424,277	462,485	422,282
Europe:									
United Kingdom	800	709	795	248.1	202.8	------	198,501	143,807	------
Irish Free State	*369*	*346*	*348*	*238.1*	*208.5*	------	*87,856*	*72,132*	------
Norway	120	116	123	263.3	245.3	309.2	31,592	28,451	38,029
Sweden	*366*	*327*	*337*	173.2	168.3	217.0	63,397	*55,033*	73,119
Denmark	173	157	172	209.5	205.3	286.3	36,243	32,236	49,236
Netherlands	433	406	434	280.0	247.6	311.6	121,249	100,536	135,215
Belgium	408	425	435	305.4	309.2	297.7	124,585	131,426	129,503
France	3,606	3,533	3,480	145.3	169.5	167.5	523,939	598,908	583,045
Spain	[2] *812*	*1,024*	*1,042*	[2] *172.0*	*167.8*	*180.9*	[2] *139,671*	*171,847*	*188,526*
Italy	868	1,019	1,022	83.9	70.8	101.5	72,837	72,184	103,751
Switzerland	116	113	115	224.7	249.2	214.7	26,069	28,164	24,688
Germany	6,945	6,979	7,114	201.7	230.9	242.8	1,400,991	1,611,797	1,727,540
Austria	453	478	511	183.7	208.8	163.8	83,216	99,824	83,723
Czechoslovakia	1,738	1,775	1,811	178.4	201.3	170.5	310,025	357,377	308,720
Hungary	652	701	729	110.6	75.9	84.9	72,221	53,186	61,921
Yugoslavia	*560*	*584*	------	*74.4*	*69.9*	------	*41,649*	*40,815*	------
Rumania	644	683	------	117.8	108.0	------	75,865	73,795	------
Poland	*6,125*	*6,715*	*6,709*	*158.7*	*169.6*	*147.5*	*972,152*	1,138,617	989,492
Lithuania	347	409	427	155.1	176.3	157.2	53,810	72,089	67,134
Latvia	200	247	253	142.4	173.6	175.0	28,477	42,881	44,280
Estonia	166	168	166	158.1	186.9	152.1	26,245	31,398	25,246
Finland	171	174	192	160.8	153.2	192.4	27,495	26,661	36,945
Russia	13,496	*15,103*	*15,101*	*118.1*	------	------	1,594,077	------	------
Total European countries reporting area and production, all years	23,699	24,766	25,072	173.6	187.9	186.3	4,114,214	4,652,615	4,670,113
Estimated European total, excluding Russia	26,200	27,300	27,700	------	------	------	4,533,000	5,033,000	5,104,000
Total Northern Hemisphere countries reporting area and production, all years	27,305	28,725	28,962	166.2	178.1	175.8	4,538,491	5,115,100	5,092,395
Estimated Northern Hemisphere total, excluding Russia and China	30,700	32,200	32,500	------	------	------	5,031,000	5,576,000	5,607,000
SOUTHERN HEMISPHERE									
Chile	93	104	------	145.8	153.5	------	13,557	15,966	------
Argentina	297	------	------	97.7	------	------	29,031	------	------
Australia	140	------	------	95.1	------	------	13,315	------	------
Estimated Southern Hemisphere total	2,000	2,200	------	------	------	------	*110,000*	*120,000*	------
Estimated world total, excluding Russia and China	32,700	34,400	------	------	------	------	5,141,000	5,696,000	------

Bureau of Agricultural Economics. Both acreage and production figures refer to the year of harvest. Harvests of the Northern Hemisphere are combined with those of the Southern Hemisphere which immediately follow; thus, for 1931–32 the crop harvested in the Northern Hemisphere countries in 1931 is combined with the Southern Hemisphere harvest which begins late in 1931 and ends early in 1932.

[1] Preliminary.   [2] 4-year average.

TABLE 229.—*Potatoes: Car-lot shipments, United States, by months, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	17,262	14,609	24,468	23,199	16,302	20,295	16,733	16,735	24,063	35,223	20,737	11,977	241,603
1924	19,762	20,716	22,940	19,461	18,736	20,845	23,626	16,394	21,367	34,141	20,852	13,237	252,097
1925	21,715	20,394	21,639	20,123	20,215	19,798	17,765	14,864	23,569	33,631	16,286	11,524	241,523
1926	16,185	14,834	19,974	14,238	16,903	23,587	20,310	15,327	22,978	36,182	18,419	13,487	232,424
1927	17,974	17,784	21,497	20,283	16,691	22,155	21,053	17,853	25,003	38,333	21,124	13,695	253,445
1928	20,278	22,913	23,710	17,255	23,740	29,675	21,048	16,252	21,127	29,906	18,232	13,207	257,343
1929	20,096	20,472	23,059	20,153	20,360	24,813	19,583	17,395	24,441	31,958	15,706	15,158	253,194
1930	20,302	19,918	22,108	19,769	22,803	25,004	22,326	10,775	22,415	29,076	16,502	15,413	252,411
1931	21,241	20,321	23,888	21,461	24,080	27,276	20,434	12,015	17,715	24,759	14,510	13,303	241,003
1932 [1]	17,756	18,912	24,858	21,418	18,380	22,091	15,788	8,453	12,825	14,443	11,800	11,946	198,670

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis, 400 to 700 bushels to a carload. Shipments by truck not included.

[1] Preliminary.

TABLE 230.—*Potatoes: Car-lot shipments, by State of origin, 1922–1931*

State	Crop-movement season [1]									
	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Maine	24,404	34,764	43,145	38,830	42,607	40,945	41,111	61,404	53,381	53,168
New Hampshire	56	88	67	105	130	163	118	119	268	71
Vermont	130	234	161	144	247	223	145	163	503	224
New York	19,298	18,628	20,123	11,598	12,573	12,320	13,478	9,208	13,700	10,405
New Jersey	18,335	6,352	8,037	3,355	4,750	6,676	5,367	3,811	6,600	5,179
Pennsylvania	5,751	4,092	3,943	6,027	2,630	3,375	5,829	2,132	600	634
Ohio	95	173	66	617	285	339	296	493	264	144
Indiana	17	52	50	398	183	128	191	118	49	12
Illinois	21	261	270	151	112	14	94	32	54	76
Michigan	19,833	20,558	17,450	14,201	16,455	8,568	14,189	6,337	3,379	8,858
Wisconsin	21,788	17,137	16,031	16,025	18,153	15,455	15,850	14,709	10,484	13,350
Minnesota	28,931	33,602	31,695	23,163	25,049	33,482	20,456	22,923	16,346	10,207
Iowa	843	273	554	220	92	149	427	674	342	171
Missouri	887	810	1,194	919	1,616	1,294	2,362	984	2,016	1,473
North Dakota	8,351	10,384	6,063	4,810	4,815	7,933	6,333	6,026	4,687	7,277
South Dakota	2,703	3,860	1,886	1,024	518	2,537	1,403	2,144	749	79
Nebraska	5,504	4,333	2,918	4,342	3,228	6,039	4,784	7,212	9,160	8,307
Kansas	2,433	3,565	4,797	2,735	4,062	4,341	4,848	2,440	3,856	2,710
Delaware	240	207	90	30	52	214	27	54	8	24
Maryland	3,497	2,728	2,679	1,512	2,031	3,545	3,123	2,426	2,240	1,752
Virginia	19,023	15,923	23,608	15,882	16,212	23,717	27,679	21,177	21,731	18,644
West Virginia	25	85	88	88	119	177	360	412	87	165
North Carolina	4,194	3,478	6,568	4,040	6,713	7,555	9,738	6,003	7,355	8,681
South Carolina	4,345	4,210	5,268	3,674	5,223	3,943	4,706	3,809	4,544	5,030
Georgia	511	371	544	255	373	489	321	272	576	808
Florida	5,046	3,495	4,382	5,137	4,809	5,410	7,744	5,069	4,802	6,892
Kentucky	496	1,241	1,593	735	430	877	718	1,211	518	447
Tennessee	52	97	223	249	313	276	436	272	287	129
Alabama	1,925	1,384	2,920	1,046	2,222	2,102	3,133	1,541	2,728	4,712
Mississippi	187	88	202	30	38	68	147	114	119	368
Arkansas	341	231	449	537	526	508	239	514	814	836
Louisiana	1,083	825	1,425	1,280	1,429	1,298	1,727	1,102	2,327	4,410
Oklahoma	1,000	1,035	1,282	2,335	2,164	2,130	2,058	2,208	2,755	2,171
Texas	1,491	792	1,422	1,431	2,014	3,031	3,468	2,709	5,480	5,045
Montana	1,412	757	420	1,509	888	1,376	756	380	537	393
Idaho	16,203	15,626	11,942	18,271	17,329	28,305	18,887	19,011	32,903	25,916
Wyoming	1,037	687	652	998	763	2,021	1,385	1,731	2,775	2,142
Colorado	15,467	13,870	12,386	15,422	14,200	17,328	13,714	15,366	18,080	7,529
Arizona	344	84	15	27	64	61	75	50	49	80
Utah	2,037	1,017	727	1,162	1,078	954	454	939	1,044	954
Nevada	744	700	452	719	780	942	595	442	593	248
Washington	5,132	6,160	6,654	8,880	9,842	9,602	8,054	8,097	7,988	6,992
Oregon	1,842	1,615	927	1,494	2,719	2,339	1,653	1,560	2,881	3,068
California	7,697	5,696	6,492	6,159	7,184	7,904	7,666	7,769	7,887	6,959
Other States	21	27	10	55	48	56	23	58	39	21
Total	254,332	242,095	252,450	221,621	237,028	270,209	256,165	245,285	257,565	245,760

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis, 400 to 700 bushels to a carload. Shipments by truck not included.

[1] Crop movement season covers 19 months, from December through the second following June; i. e., the 1922 season begins in December, 1921, and ends June, 1923.

[2] Preliminary beginning January, 1932.

TABLE 231.—*Potatoes: International trade, average 1925–1929, annual 1928–1931*

Country	Average, 1925–1929 Exports	Average, 1925–1929 Imports	1928 Exports	1928 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Netherlands	17,967	659	17,833	1,231	21,078	388	20,602	373	18,678	1,072
Belgium	9,012	5,090	14,027	4,197	10,889	8,037	9,726	9,562	9,958	10,881
Italy	7,761	*1,933*	7,612	4,265	*5,690*	4,223	4,853	*1,960*	4,533	4,215
Canada	7,118	688	6,309	708	7,145	1,189	7,128	844	6,136	329
Poland	3,856	12	2,929	8	3,240	8	1,478	4	4,794	9
Hungary	2,773	262	2,255	435	2,716	464	1,899	94	3,080	53
Spain	2,341	1,220	2,624	1,800	3,602	1,917	2,576	762	4,018	745
Argentina	2,138	213	1,901	42	2,338	462	2,610	557	1,591	18
Algeria	1,475	1,413	1,396	1,800	1,479	1,423	1,552	1,935	1,075	1,840
Czechoslovakia	1,062	*951*	1,208	*534*	1,147	*438*	347	443	139	423
Estonia	886	1	1,380	1	490	0	412	0	974	1
Irish Free State	865	*647*	*1,473*	322	*678*	*762*	386	*557*	*1,144*	298
Russia	756	[2] 9	[3] 2,495	[3] 0	[3] 157	[3] 0	1	0	4	0
Japan	606	0	734	0	603	0	752	0	1,874	0
China	193	0	187	0	312	0	365	0	455	0
Total	58,808	13,104	64,363	15,343	61,562	19,331	54,693	17,091	58,462	19,884
PRINCIPAL IMPORTING COUNTRIES										
Germany	5,346	*16,623*	6,683	*17,956*	*4,170*	*11,303*	3,671	*11,755*	*18,175*	4,355
United Kingdom	2,779	14,071	1,864	17,727	5,450	10,844	2,006	10,735	1,694	31,039
France	9,850	12,205	12,653	14,422	8,715	15,538	7,503	9,191	6,763	16,332
United States	2,434	4,284	2,698	3,710	2,735	4,276	1,899	5,060	1,060	4,567
Cuba	75	3,903	151	3,616	90	3,428	83	2,303		
Austria	865	*2,596*	*3,001*	*2,066*	*966*	*2,401*	223	*1,625*	204	966
Switzerland	4	2,328	5	2,822	3	2,044	1	3,330	4	2,694
Portugal	120	1,748	69	2,397	70	2,363	63	2,489		
Uruguay	1	1,483	2	1,210	0	1,587	1	1,846		
Brazil	*0*	*1,182*	*0*	*1,023*	*0*	*1,488*	*0*	*1,093*	4	265
Egypt	139	845	247	753	195	949	43	765	242	544
Denmark	67	719	38	1,981	46	301	38	332	704	210
Finland	1	624	0	738	0	928	0	256	0	81
Yugoslavia	98	469	67	652	29	938	67	84	34	25
Sweden	36	422	1	1,082	0	31	1	74	28	543
Tunis	2	411	3	409	1	489	1	510	2	482
Philippine Islands	0	358	0	382	0	406	0	340	0	468
Venezuela	0	161	0	228	0	273	0	260	0	269
Norway	44	*62*	*15*	99	24	3	*21*	1	228	28
Total	21,861	64,492	27,477	73,273	22,494	50,592	15,741	52,145	29,232	62,888

Bureau of Agricultural Economics. *Official sources except where otherwise noted.* These figures do not include sweetpotatoes.

[1] Preliminary. [2] 3-year average. [3] International Yearbook of Agricultural Statistics.

TABLE 232.—*Potatoes: Estimated average price per bushel received by producers United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	102.9	120.8	*109.6*	*91.4*	82.5	81.5	86.4	88.1	87.8	*91.1*	91.3	100.7	94.6
1924–25	109.0	111.3	81.0	68.8	63.5	64.1	70.2	72.3	71.4	70.5	70.6	84.4	77.9
1925–26	125.5	155.4	121.1	125.6	198.4	201.5	220.5	226.0	225.6	270.5	244.8	190.1	183.4
1926–27	174.6	140.5	130.6	126.4	141.3	137.0	139.1	134.1	127.0	126.8	146.0	191.0	142.0
1927–28	183.1	146.3	107.4	97.9	95.4	94.1	93.6	96.2	113.1	116.8	103.3	83.6	109.1
1928–29	77.4	71.9	64.8	58.0	56.9	57.7	58.9	59.5	58.4	55.3	59.3	63.7	61.9
1929–30	88.0	139.1	136.0	138.2	134.8	135.3	137.8	139.1	136.3	145.8	149.9	148.6	136.2
1930–31	129.4	106.8	109.9	101.4	95.0	89.8	90.3	86.7	84.9	90.8	87.0	75.3	95.5
1931–32	82.5	76.7	60.1	45.8	45.3	45.7	47.1	44.8	45.7	46.4	47.0	44.4	51.8
1932–33	48.8	51.4	38.0	34.4	34.4	36.8							

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by car-lot shipments. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1922–December, 1923. For previous data see 1930 or earlier Yearbooks.

TABLE 233.—*Potatoes, Idaho, Russet Burbanks: Average car-lot price per 100 pounds to jobbers at Chicago, 1923–24 to 1932–33*

Season	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1923–24				1.91	1.78	2.28	2.24	2.51	2.68	2.10
1924–25				2.04		2.30	2.59	2.41	2.44	
1925–26				3.99	3.67	4.19	3.95	4.15	4.78	3.51
1926–27			2.84	2.93	2.75	2.83	2.75	2.88	3.24	4.24
1927–28		2.33	1.78	1.75	1.59	1.73	1.89	2.51	1.97	1.50
1928–29			1.63	1.65	1.60	1.64	1.68	1.00	1.83	1.95
1929–30		3.11	2.98	2.86	2.88	3.18	3.14	3.19	3.79	3.59
1930–31	[1] 2.48	2.71	2.18	1.88	1.82	1.84	1.62	1.67	1.70	1.51
1931–32	1.84	1.72	1.43	1.39	1.52	1.54	1.40	1.38	1.32	1.25
1932–33		1.30	1.14	1.19	1.17					

Bureau of Agricultural Economics. Compiled from daily market reports from the bureau representative at the market. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices.

[1] Less-than-car-lot sales to jobbers.

TABLE 234.—*Potatoes, Round Whites: Price per 100 pounds, car-lot sales to jobbers Chicago, 1920–21 to 1932–33*

Season	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1920–21	8.09	6.55	3.46	2.46	1.84	2.03	1.50	1.29	1.16	1.23	0.98	0.87	
1921–22	2.25	2.70	3.36	2.49	1.96	1.75	1.77	1.98	1.84	1.71	1.60	1.58	
1922–23	3.33	2.29	1.69	1.22	.92	.86	.83	.92	.96	1.15	1.23	1.02	
1923–24	3.46	2.90	2.33	1.68	1.05	.99	1.10	1.42	1.37	1.31	1.32	1.30	1.46
1924–25	[1] 2.70	1.87	1.42	1.35	.87	.92	.99	1.12	1.09	1.03	.81	1.17	1.24
1925–26	3.18	3.24	2.55	1.96	2.50	3.45	3.65	4.02	3.74	4.01	4.51	3.11	2.78
1926–27	3.82	2.36	2.30	2.44	2.26	2.36	2.24	2.29	1.98	1.95	2.13	3.18	3.91
1927–28	4.55	2.30	2.03	1.76	1.53	1.54	1.53	1.52	1.78	2.17	1.86	1.40	.98
1928–29	1.76	1.16	1.05	1.00	.81	.86	.90	1.00	.87	.78	.70	.80	.84
1929–30	2.53	2.75	2.49	2.49	2.38	2.27	2.31	2.51	2.47	2.39	2.85	2.73	
1930–31	2.95	1.80	1.81	2.13	1.72	1.47	1.41	1.45	1.30	1.45	1.47	1.26	
1931–32	1.61	1.49	1.26	.93	.82	.80	.82	.82	.80	.84	.82	.82	.79
1932–33	1.47	1.04	.78	.70	.64	.68	.74						

Bureau of Agricultural Economics. Compiled from daily market reports from the bureau representative at the market. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. Crop-movement season for Round Whites begins in June and ends in June of following year.

[1] Less than car-lot sales to jobbers.

TABLE 235.—*Sweetpotatoes: Acreage, production, and value, United States 1919–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1
	1,000 acres	*Bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*		*1,000 acres*	*Bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*
1919	*805*	*97.3*	*78,092*			1926	646	98.3	63,531	93.8	59,612
1919	792	99.0	78,422	133.6	104,746	1927	724	98.3	71,156	82.7	58,856
1920	768	100.4	77,124	112.9	87,072	1928	638	93.5	59,650	90.9	54,218
1921	819	90.3	73,958	88.2	65,204	1929	*650*	*100.3*	*65,193*		
1922	819	96.1	78,665	76.6	60,262	1929	646	100.6	64,963	[1] 117.1	[2] 76,081
1923	675	94.9	64,041	98.1	62,831	1930	649	81.8	53,117	[1] 108.2	[2] 57,482
1924	*467*	*80.2*	*37,444*			1931	785	80.3	63,043	[1] 72.5	[2] 45,688
1924	567	79.7	45,201	127.4	57,600	1932 [3]	926	84.8	78,484	[1] 48.0	[2] 37,652
1925	637	78.9	50,241	134.9	67,752						

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the Crop Reporting Board, revised, 1919 to 1928. See introductory text; italic figures are census returns. Prices are based upon returns from crop reporters.

[1] Weighted average price for crop marketing season.
[2] Based on weighted average price for crop marketing season.
[3] Preliminary.

TABLE 236.—*Sweetpotatoes: Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*
New Jersey	13	13	12	124	150	130	1,666	1,950	1,560	72	66
Indiana	2	4	4	118	135	110	275	540	440	80	62
Illinois	6	6	7	90	102	105	498	612	735	64	41
Iowa	2	3	3	91	100	100	192	300	300	97	65
Missouri	8	10	10	96	90	90	772	900	900	86	51
Kansas	4	6	6	122	95	120	510	570	720	90	55
Delaware	6	8	7	135	175	118	809	1,400	826	40	39
Maryland	8	11	8	146	183	115	1,348	2,013	920	54	45
Virginia	36	38	38	130	125	95	4,651	4,750	3,610	61	36
North Carolina	64	80	94	100	82	85	6,185	6,560	7,990	70	60
South Carolina	44	53	66	84	90	92	3,392	3,180	6,072	68	46
Georgia	86	91	109	80	50	82	6,273	4,550	8,938	107	44
Florida	21	21	25	87	78	60	1,813	1,638	1,500	106	65
Kentucky	15	21	25	90	98	88	1,257	2,058	2,200	80	61
Tennessee	49	68	75	103	80	88	4,820	5,440	6,600	65	38
Alabama	64	78	101	86	65	85	5,470	5,070	8,585	88	63
Mississippi	52	63	79	91	88	100	4,677	5,544	7,900	73	40
Arkansas	26	32	38	98	82	70	2,585	2,624	2,660	61	48
Louisiana	64	72	84	77	75	66	4,687	5,400	5,544	60	44
Oklahoma	16	18	22	97	70	72	1,583	1,260	1,584	70	46
Texas	44	77	100	82	72	76	3,424	5,544	7,600	63	38
California	10	12	13	106	95	100	957	1,140	1,300	94	55
United States	641	785	926	92.9	80.3	84.8	57,822	63,043	78,484	72.5	48.0

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 237.—*Sweetpotatoes: Car-lot shipments, by State of origin, 1922–23 to 1931–32*

State	Crop-movement season [1]									
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New Jersey	2,857	1,528	1,894	1,357	1,770	1,225	1,223	1,090	1,078	1,531
Indiana	65	75	103	236	284	209	231	352	355	484
Illinois	113	81	73	101	151	119	85	164	193	211
Delaware	2,632	1,549	1,750	1,742	1,885	1,517	1,470	1,454	771	1,346
Maryland	1,750	1,123	1,155	1,520	2,283	2,256	2,106	1,859	976	862
Virginia	6,633	5,374	5,213	4,750	6,501	6,618	6,480	7,090	5,361	4,973
North Carolina	680	563	816	1,510	1,683	1,711	760	729	883	592
South Carolina	236	154	120	231	162	276	130	375	337	70
Georgia	781	610	1,018	674	678	667	227	527	348	335
Florida	123	62	175	241	165	159	69	125	114	166
Kentucky	55	30	31	90	302	185	121	268	222	479
Tennessee	1,495	726	1,137	2,592	4,972	3,587	2,915	3,692	2,903	2,410
Alabama	537	382	649	663	515	574	393	570	320	362
Mississippi	116	61	36	156	79	211	126	271	219	133
Arkansas	240	263	371	476	548	392	316	207	175	128
Louisiana	1,033	463	558	2,340	1,285	1,147	981	1,463	1,224	1,315
Oklahoma	85	110	107	216	268	294	255	102	78	16
Texas	974	535	221	485	702	1,284	717	802	717	593
California	982	684	466	1,161	1,186	805	767	728	869	632
Other States	175	159	174	318	316	187	178	174	234	190
Total	21,562	14,532	16,067	20,859	25,755	23,423	19,545	22,042	17,376	16,828

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from July 1 of one year through June of the following year. Figures for certain States include shipments for month preceding or following the regular crop-movement season.

[2] Preliminary.

TABLE 238.—*Sweetpotatoes: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	112.1	151.3	133.6	114.8	101.0	103.8	112.5	123.7	129.0	140.4	139.2	138.9	120.8
1924–25	130.7	151.4	157.0	145.1	130.3	140.1	145.5	160.2	180.8	196.2	189.1	170.2	149.7
1925–26	188.7	196.3	177.4	169.4	144.4	141.5	149.3	162.4	171.4	180.4	192.2	198.8	166.9
1926–27	185.6	189.0	153.9	110.6	88.5	94.0	97.8	109.0	112.3	112.8	118.9	136.0	118.7
1927–28	136.4	146.7	121.9	98.1	86.5	91.9	93.4	98.6	109.6	115.1	121.4	124.7	107.7
1928–29	119.5	131.0	120.9	111.2	100.2	101.8	104.2	113.7	117.0	120.8	125.9	129.8	113.4
1929–30	135.9	136.2	127.9	112.5	97.7	98.9	103.1	100.6	114.6	118.3	126.4	128.6	114.6
1930–31	125.0	136.3	128.7	110.7	93.8	94.1	98.1	100.8	105.5	113.7	115.2	108.5	109.8
1931–32	101.1	107.8	81.4	66.1	58.2	58.5	61.4	61.8	64.4	64.0	64.6	62.5	70.5
1932–33	63.9	68.1	55.3	44.0	37.7	38.9							

Bureau of Agricultural Economics. Based upon *returns from special price reporters. Monthly prices* by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by average monthly marketings. For previous data see 1930 or earlier Yearbooks.

TABLE 239.—*Sweetpotatoes: Average l. c. l. price per bushel to jobbers, New York and Chicago, 1923–24 to 1932–33*

Market, and season beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
New York:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1923–24		1.16	1.20	1.95	2.51	2.94	3.38	3.62	3.98	
1924–25		1.98	1.47	1.88	2.47	2.75	2.74	2.63		
1925–26	1.53	1.70	1.68	1.70	2.23	2.61	2.59	2.96	3.42	
1926–27	2.21	1.47	.97	.98	1.24	1.37	1.46	1.61	1.81	2.09
1927–28	1.31	1.13	.93	1.29	1.48	1.66	1.88	2.08	2.04	
1928–29	1.67	1.29	1.05	1.31	1.62	1.88	2.14	2.32		
1929–30	1.60	1.34	1.09	1.28	1.60	1.58	1.46	1.66	2.06	
1930–31	1.77	1.40	1.21	1.26	1.56	1.90	2.15	2.09		
1931–32	1.21	.67	.56	.56	.57	.56	.67	.68	.74	
1932–33	.81	.60	.54	.54	.61					
Chicago:										
1923–24		1.67	1.52	2.03	2.73	3.09	3.31	3.76	4.04	
1924–25		2.29	1.88	2.33	2.80	2.92	3.26	2.94		
1925–26	2.04	2.04	2.02	2.25	2.42	2.37	2.29	2.40	2.98	
1926–27	2.23	1.72	1.30	1.37	1.69	1.70	1.66	1.52	1.23	1.44
1927–28	1.54	1.55	1.39	1.44	[1] 1.68	[1] 2.16	[1] 2.51	[1] 2.09	[1] 2.22	
1928–29	2.01	1.69	1.46	1.92	[1] 2.30	[1] 2.40	[1] 2.49	[1] 2.37		
1929–30	1.76	1.83	1.57	[1] 1.64	1.78	[1] 1.90	2.06	2.22	2.61	
1930–31	2.21	1.81	1.59	1.77	1.74	1.88	2.02	2.26		
1931–32	1.12	1.06	.89	1.03	.97	.88	1.02	.99	.95	
1932–33	.94	1.13	.93	.94	1.08					

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

[1] Kiln-dried.

TABLE 240.—*Spinach, commercial crop: Acreage, production, and price per bushel or ton, 1929–1932*

Utilization	Acreage				Production				Seasonal farm price			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
For market	49,990	46,390	49,190	48,120	14,970	11,311	[2] 13,649	[2] 11,288	0.45	0.54	0.40	0.46
					Short tons	*Short tons*	*Short tons*	*Short tons*				
For manufacture	18,170	9,350	7,850	5,540	96,900	38,400	34,700	20,500	16.76	14.79	12.82	12.98
Total	68,160	55,740	57,040	53,660	246,600	151,510	[2] 171,190	[2] 133,380	33.65	43.77	34.18	40.81

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 20 pounds.
[2] Includes some quantities not harvested on account of market conditions, 19,000 bushels in 1931 and 31,000 bushels in 1932. Price refers to harvested portion of crop.

TABLE 241.—*Spinach: Car-lot shipments, by State of origin, 1921–1932*

State	Crop-movement season [1]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	5	4	24	23	12	12	14	24	102	41	46	46
Maryland	393	603	798	725	619	846	670	749	628	172	441	100
Virginia	2,475	2,212	3,208	3,107	2,946	2,669	3,213	3,066	2,974	2,580	1,332	1,127
South Carolina	-------	161	422	161	501	614	462	282	110	75	82	5
Arkansas	-------	2	2	3	24	37	47	191	84	141	127	61
Texas	1,463	1,465	2,433	3,038	3,235	4,513	4,495	5,528	5,559	6,085	7,302	6,669
California	149	302	473	70	241	305	445	334	494	177	71	100
Washington	*19*	*13*	*23*	*40*	*123*	*121*	*145*	*156*	*154*	*207*	*170*	*144*
Other States	242	162	197	340	218	266	164	263	243	152	202	115
Total	4,746	4,914	7,580	7,507	7,919	9,383	9,655	10,593	10,348	9,630	9,773	8,367

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from October of the preceding year through December of the year shown Figures for Maryland, Washington, and New Jersey, include shipments in January succeeding the regular crop-movement season.
[2] Preliminary.

TABLE 242.—*Strawberries, commercial crop: Acreage, production and price per crate, by States, 1929–1932*

Group and State	Acreage				Production [1]				Seasonal farm price per crate			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
Early:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 crates* [2]	*1,000 crates* [2]	*1,000 crates* [2]	*1,000 crates* [2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Albama	6,200	6,500	3,850	4,300	471	280	424	280	2.40	3.10	2.90	1.50
Florida	6,800	9,000	9,100	8,100	544	603	655	616	5.30	6.70	5.75	4.80
Louisiana	24,360	24,600	24,600	29,500	1,437	1,181	1,870	1,504	6.00	5.50	4.55	2.64
Mississippi	1,080	1,240	1,400	2,560	73	51	105	128	3.35	2.65	2.75	1.87
Texas	3,160	2,030	1,550	2,100	123	73	136	126	2.90	4.30	6.25	3.85
Total	41,600	43,370	40,500	46,560	2,648	2,188	3,190	2,654	4.46	5.42	4.59	3.04
Second early:												
Arkansas	22,000	15,300	9,000	16,500	1,122	474	531	1,040	2.60	3.60	2.55	1.90
California (southern district)	1,280	1,800	1,740	1,500	266	385	353	340	4.30	3.85	3.85	2.40
Georgia	400	300	250	330	18	14	20	17	2.90	2.60	2.65	1.88
North Carolina	7,000	5,400	5,300	6,200	679	437	678	496	3.10	2.90	2.65	1.80
South Carolina	500	360	320	450	34	24	27	32	3.35	2.90	2.65	2.06
Tennessee	16,810	12,600	10,000	15,000	1,076	617	590	705	2.40	3.10	2.50	1.25
Virginia	8,980	7,900	*5,520*	*6,350*	682	*403*	*370*	*413*	2.60	*2.60*	2.70	*1.64*
Total	56,970	43,660	32,130	46,330	3,877	2,354	2,569	3,043	2.76	3.20	2.77	1.76
Intermediate:												
California (other)	2,280	2,250	2,450	2,670	326	484	502	566	3.85	3.60	3.35	2.32
Delaware	4,500	4,100	2,460	3,600	382	242	140	324	2.60	2.90	2.60	1.15
Illinois	4,790	*4,070*	4,270	*5,120*	283	183	205	333	2.15	3.60	3.00	1.50
Kansas	960	860	860	950	64	34	48	57	2.40	3.60	2.40	2.20
Kentucky	*6,240*	4,250	*3,530*	*5,700*	443	217	194	479	2.60	4.30	3.75	1.90
Maryland	9,500	7,800	4,300	7,600	684	413	258	608	2.60	2.90	2.75	1.35
Missouri	21,990	15,000	12,150	15,920	1,209	495	474	685	2.60	4.55	3.00	2.00
New Jersey	4,000	4,500	5,000	6,000	276	306	400	678	2.40	3.80	2.50	1.44
Oklahoma	1,900	1,400	1,120	1,450	76	38	28	51	2.40	3.35	3.50	2.15
Total	56,160	44,230	36,140	49,010	3,743	2,412	2,249	3,781	2.65	3.69	2.99	1.72
Late:												
Indiana	1,510	1,540	1,350	1,890	119	57	112	159	3.10	3.80	2.50	1.60
Iowa	2,690	2,770	2,700	2,900	172	166	176	218	4.30	4.55	2.90	2.10
Michigan	6,940	7,220	7,000	8,350	361	455	595	601	4.30	4.55	2.45	1.45
New York	4,300	4,390	*4,600*	*4,960*	*378*	*386*	*492*	*521*	*4.10*	*4.55*	*2.60*	*1.85*
Ohio	4,370	4,280	3,100	4,000	310	154	208	280	3.10	4.55	2.85	1.90
Oregon	*10,500*	*9,450*	*9,930*	12,120	693	*567*	695	970	*3.60*	*3.35*	2.90	*1.08*
Pennsylvania	2,870	2,900	2,670	3,070	261	206	248	276	3.35	3.80	2.50	1.75
Utah	*1,510*	*1,510*	*1,510*	1,200	106	106	60	100	2.90	2.90	2.20	1.80
Washington	7,900	7,500	7,880	8,980	529	338	528	736	2.90	3.60	2.90	1.60
Wisconsin	2,840	2,840	2,900	3,050	258	145	200	235	3.60	4.80	2.45	1.80
Total	45,430	44,400	43,640	50,520	3,187	2,580	3,314	4,096	3.55	4.03	2.69	1.56
Grand total	200,160	175,660	152,410	192,420	13,455	9,534	11,322	13,574	3.25	4.06	3.30	1.94

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Includes undetermined quantities used for canning, cold pack, etc.
[2] 24-quart crates containing approximately 36 pounds.

TABLE 243.—*Strawberries: Car-lot shipments, by State of origin, 1928–1932*

Group and State	Calendar year [1]				
	1928	1929	1930	1931	1932 [2]
Early:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Ala	1,021	1,354	771	1,154	755
Fla	545	1,633	1,721	1,862	1,760
La	2,850	2,859	2,389	4,720	2,664
Miss	88	115	74	127	131
Tex	148	253	92	65	38
Other States	-----	1	6	-----	-----
Second early:					
Ark	2,046	2,488	688	578	1,719
Calif., southern district	18	10	16	13	75
N. C	2,151	1,483	756	1,228	619
S. C	71	30	9	44	58
Tenn	2,180	2,151	1,158	1,066	1,282
Va	984	849	335	525	393
Other States	23	17	9	17	11
Intermediate:					
Calif., other	141	162	203	174	362
Del	621	418	203	111	94
Ill	324	273	163	119	175
Intermediate:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Ind	126	105	33	64	150
Iowa	19	52	48	36	44
Kans	2	63	29	23	13
Ky	1,078	851	404	395	1,087
Md	980	734	424	352	319
Mo	2,637	2,062	807	692	795
N. J	186	176	106	60	67
Okla	46	111	39	3	12
Late:					
Mass	35	47	44	21	21
Mich	61	79	57	53	71
N. Y	70	55	31	58	85
Oreg	99	103	35	40	112
Wash	106	61	12	23	32
Wis	39	26	7	8	59
Other States	20	5	-----	9	7
Total	18,715	18,626	10,669	13,640	13,010

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop movement is for calendar year, except Florida, which begins in December of the preceding year.
[2] Preliminary.

TABLE 244.—*Tomatoes: United States commercial production, imports and exports, annual, 1923–1932*

Year	Commercial production		Imports, year beginning July			Exports, year beginning July	
	For market	For manufacture	Fresh	Canned [1]	Paste	Canned	Catsup and sauces
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1923	972,300	2,330,600	[2] 50,838	32,287	[2] 4,164	9,152	[2] 3,560
1924	1,043,300	2,380,400	69,216	83,345	17,382	5,203	5,520
1925	1,095,800	3,618,400	82,448	84,897	18,179	5,794	5,006
1926	762,400	1,997,200	124,489	80,257	15,642	7,504	7,556
1927	976,300	2,391,800	113,357	103,782	12,064	6,725	8,584
1928	871,000	1,994,400	128,627	114,042	9,539	4,009	13,066
1929	938,400	3,069,600	139,886	147,429	16,547	4,872	10,419
1930	946,500	3,515,200	113,480	75,173	11,605	2,916	5,210
1931	939,500	1,953,000	122,215	91,572	12,154	4,621	3,221
1932	1,030,100	2,282,000	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Production figures based on returns from crop reporters and canning establishments; imports and exports compiled from Monthly Summary of Foreign Commerce of the United States, June issues.

[1] Includes "otherwise prepared."
[2] January–June, 1924

TABLE 245.—*Tomatoes, commercial crop: Acreage, production, and price per bushel or ton, 1929–1932*

Utilization, marketing season, and State	Acreage				Production				Seasonal farm price			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
For market:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*1,000 bush.*[1]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Fall	5,300	3,980	6,570	3,600	344	264	371	272	2.67	2.39	2.39	2.97
Early (sec. 1)	14,700	11,800	8,300	8,500	1,323	1,298	772	1,360	3.00	3.60	2.15	2.16
Early (sec. 2)	29,400	29,600	28,700	19,760	2,214	2,079	2,283	1,299	2.48	3.09	1.29	2.56
Second early	26,790	34,130	39,050	40,600	3,287	[2] 3,967	3,857	3,214	2.15	1.26	1.01	1.29
Intermediate	32,630	35,500	39,120	44,770	4,952	4,443	[2] 4,790	[2] 5,845	1.54	1.15	.80	.69
Late (sec. 1)	25,920	30,840	30,340	38,130	3,987	4,052	3,981	[2] 5,373	1.11	1.16	1.00	.57
Late (sec. 2)	8,350	10,500	7,600	8,600	651	798	722	[2] 1,032	1.95	1.43	1.76	1.19
Total	143,090	156,350	159,680	163,960	16,758	[2] 16,901	[2] 16,776	[2] 18,395	1.84	1.64	1.10	1.04
For manufacture:					*Short tons*	*Short tons*	*Short tons*	*Short tons*				
New York	13,600	15,500	11,300	10,200	85,700	77,500	91,500	87,700	15.70	15.40	13.30	9.80
New Jersey	33,000	43,000	30,000	30,000	214,500	258,000	132,000	186,000	21.00	19.40	15.60	14.80
Pennsylvania	3,420	5,400	4,800	6,500	13,700	16,200	17,300	29,900	15.00	15.40	13.80	13.20
Ohio	10,950	12,400	10,300	9,300	52,600	67,000	61,800	60,400	12.00	12.00	9.70	7.60
Indiana	59,840	79,000	64,000	62,000	251,300	395,000	192,000	248,000	13.20	13.30	10.00	8.10
Illinois	5,440	6,500	4,650	5,300	20,700	20,800	22,300	16,400	13.00	13.40	12.00	9.80
Michigan	1,990	2,600	2,000	1,900	9,000	14,000	14,000	11,400	12.00	12.00	9.80	7.00
Iowa	4,570	6,400	6,400	5,300	25,100	32,000	23,000	11,700	13.00	13.00	12.30	8.60
Missouri	20,940	28,900	19,000	16,000	60,700	60,700	34,200	32,000	13.30	13.70	11.00	8.30
Delaware	13,500	14,000	11,800	10,600	68,800	47,600	23,600	45,600	17.00	17.30	11.80	9.70
Maryland	44,000	48,900	38,000	34,200	224,400	151,600	76,000	143,600	16.10	17.40	12.00	9.70
Virginia	18,000	19,800	14,600	12,900	68,400	55,400	26,600	29,700	14.90	15.50	10.30	9.20
Kentucky	6,400	8,430	5,700	5,600	23,700	21,900	16,000	10,600	12.60	12.70	10.40	7.00
Tennessee	9,200	14,000	10,700	8,400	23,000	33,600	23,500	14,300	12.10	13.00	11.00	8.00
Arkansas	22,600	28,000	16,800	16,300	52,000	58,800	40,300	40,800	13.50	13.80	10.20	8.80
Colorado	2,030	2,230	2,500	2,300	17,700	19,000	17,500	10,800	11.00	10.90	10.50	8.10
Utah	6,180	6,200	6,200	3,000	56,900	55,800	51,500	24,600	11.00	11.50	10.20	7.90
California	41,680	52,250	28,100	27,000	241,700	329,200	87,100	113,400	15.20	15.10	12.60	10.90
Other States [3]	6,380	12,440	9,070	7,770	24,900	43,500	26,300	24,100	12.88	13.26	11.32	9.71
Total	323,720	407,950	296,120	274,570	1,534,800	1,757,600	976,500	1,141,000	15.25	15.05	11.80	10.07
Grand total	466,810	564,300	455,800	438,530	2,004,024	[2] 2,230,828	[2] 1,446,228	[2] 1,656,060	27.04	24.21	20.73	15.34

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters and canning establishments.

[1] Bushels containing approximately 56 pounds.

[2] Includes some quantities not harvested on account of market conditions, 75,000 bushels in 1930; 70,000 bushels in 1931, and 535,000 bushels in 1932. Price refers to harvested portion of crop.

[3] Other States include Alabama, Connecticut, Florida, Georgia, Idaho, Kansas, Louisiana, Mississippi, Nebraska, New Mexico, Oklahoma, Oregon, South Carolina, Texas, Washington, West Virginia, and Wisconsin.

168060°—33——36

TABLE 246.—*Tomatoes: Car-lot shipments, by State of origin, 1921–1932*

State	Calendar year [1]											
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	1,073	1,902	1,261	954	1,024	656	951	1,112	838	514	774	281
New Jersey	2,121	1,930	1,648	2,150	1,907	2,006	1,329	678	694	842	52	17
Ohio	411	558	956	1,035	1,286	1,065	1,125	926	1,020	1,007	1,360	960
Indiana	552	1,332	1,185	1,479	1,889	1,514	1,132	799	1,631	2,217	683	279
Illinois	155	229	250	230	530	422	270	240	237	316	339	139
Maryland	110	242	271	66	313	259	586	613	775	554	373	356
Virginia	91	83	44	167	379	454	360	277	488	243	166	63
North Carolina	1	------	------	8	------	12	21	3	2	118	158	162
South Carolina	59	145	431	421	568	449	187	161	348	461	348	235
Florida	5,785	10,245	9,760	9,140	7,188	4,351	9,737	8,491	8,038	6,495	5,435	6,284
Arkansas	23	47	9	38	104	281	240	389	300	318	217	228
Tennessee	370	920	501	985	1,393	2,374	2,016	2,759	2,317	2,496	2,038	2,026
Mississippi	*1,945*	*3,441*	*2,144*	*3,778*	*3,149*	*3,492*	*4,849*	*3,230*	*4,099*	*3,451*	*2,683*	*2,869*
Texas	2,025	1,893	1,084	1,694	2,398	2,890	3,393	4,435	5,338	7,546	8,774	4,056
Colorado	38	94	128	77	195	27	20	59	55	138	195	67
Utah	100	378	369	380	1,457	272	883	899	740	842	323	197
Washington	19	58	21	33	86	35	95	143	215	336	252	78
California	1,819	2,349	3,293	2,789	2,961	4,440	4,620	4,475	4,241	5,458	3,403	4,302
Other States	718	871	612	1,408	1,418	1,069	850	706	826	726	273	503
Total	17,415	26,717	23,907	26,830	28,254	26,068	32,664	30,395	32,202	33,578	27,846	23,102

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Figures for Florida, Texas, and California include shipments for months preceding or following the regular crop-movement season.
[2] Preliminary.

TABLE 247.—*Tomatoes, canned: Pack [1] in the United States, 1923–1931*

State	Season								
	1923	1924	1925	1926	1927	1928	1929	1930	1931
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
New York	266	325	389	302	300	261	329	467	497
New Jersey	412	186	418	204	254	95	257	356	144
Pennsylvania	258	150	338	118	167	95	122	151	160
Ohio	174	133	179	120	189	124	153	429	304
Indiana	717	1,050	1,955	900	1,131	613	1,134	2,029	1,192
Missouri	839	871	1,836	895	605	396	622	1,078	519
Delaware	1,216	803	1,272	228	827	325	851	755	340
Maryland	5,722	3,825	6,175	1,901	3,671	1,720	4,050	3,770	1,710
Virginia [2]	963	1,116	1,138	572	1,059	466	918	818	508
Kentucky	59	136	275	223	253	111	167	161	161
Tennessee	176	386	382	280	368	160	297	518	314
Arkansas [3]	270	768	1,168	558	678	613	769	1,050	761
Colorado [4]	182	180	309	183	127	158	195	293	227
Utah	584	417	1,353	235	792	924	768	788	1,028
California	2,397	1,767	1,839	2,347	2,257	1,991	2,812	3,460	864
Other States	437	406	744	389	459	487	701	875	844
United States	14,672	12,519	19,770	9,455	13,137	8,539	14,145	16,998	9,573

Bureau of Agricultural Economics. Compiled from National Canners' Association, 1923–1926; Bureau of Census, 1927–1929; beginning 1930, Foodstuffs Division, Bureau of Foreign and Domestic Commerce. Data for 1932 not available.

[1] Stated in cases of 24 No. 3 cans.
[2] Includes West Virginia.
[3] Previous to 1923, included in "Other States."
[4] Includes Washington.

TABLE 248.—*Walnuts: Production and value, California, 1923–1932*

Item	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932[1]
Production.........short tons..	25,000	22,500	36,000	15,000	51,000	25,000	39,000	30,000	29,000	44,000
Average price per ton, crop-marketing season...dollars..	400	460	440	480	330	420	320	410	233	222
Farm value, basis average price crop-marketing season ....1,000 dolls..	10,000	10,350	15,840	7,200	16,830	10,500	12,480	12,300	6,757	9,768

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 249.—*Watermelons, commercial crop: Acreage, production, and price per 1,000 melons,[1] 1929–1932*

Marketing season	Acreage				Production				Seasonal farm price per 1,000 melons			
	1929	1930	1931	1932	1929	1930	1931	1932	1929	1930	1931	1932
	Acres	*Acres*	*Acres*	*Acres*	*1,000 melons*	*1,000 melons*	*1,000 melons*	*1,000 melons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early..............	48,000	43,200	40,300	38,000	17,904	[2] 16,471	16,759	[2] 11,552	230	190	156	124
Second early........	132,280	147,290	145,100	141,560	37,631	[2] 51,170	[2] 39,494	[2] 29,027	151	88	82	65
Late................	36,310	45,000	53,420	53,280	14,521	14,760	19,256	[2] 19,941	160	129	91	75
Total........	*216,590*	*235,490*	*238,820*	*232,840*	*70,056*	[2] *82,401*	[2] *75,509*	[2] *60,520*	*173*	*116*	*101*	*80*

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Approximately 1,000 melons per car.
[2] Includes some quantities not harvested on account of market conditions, 5,677,000 melons in 1930; 3,125,000 melons in 1931; and 8,663,000 melons in 1932. Price refers to harvested portion of crop.

TABLE 250.—*Watermelons: Car-lot shipments, United States, 1923–1932*

Season beginning April	Crop-movement season[1]								
	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	3	762	6,176	15,351	8,583	2,046	159	2	33,081
1924	[2] 2	65	6,602	26,024	10,470	2,458	120	4	45,745
1925	....	605	11,767	17,814	11,524	2,390	82	2	44,184
1926	....	443	11,424	20,923	11,509	1,861	28	....	55,188
1927	4	1,713	15,255	20,898	6,262	1,261	67	....	45,460
1928	....	508	10,410	24,937	11,408	1,183	50	1	48,497
1929	36	3,498	22,047	18,287	7,582	1,007	57	....	52,514
1930	....	386	17,830	20,028	10,306	1,359	102	....	50,011
1931	....	121	16,282	23,733	10,344	1,593	58	....	52,131
1932[3]	2	*696*	*11,534*	*13,943*	*5,271*	*681*	34	....	*32,161*

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from Apr. 1 through November of a given year.
[2] Reported as shipped in January.
[3] Preliminary.

TABLE 251.—*Watermelons: Car-lot shipments, by State of origin, 1923–1932* [1]

State	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Indiana	484	378	646	389	45	322	299	102	305	32
Iowa	586	50	289	135	107	123	83	100	109	60
Missouri	1,783	1,432	3,293	2,843	533	851	1,039	1,405	2,641	1,796
Maryland	566	427	531	402	161	208	210	311	620	462
Virginia	166	99	375	375	294	488	487	510	935	961
North Carolina	1,542	664	991	1,301	1,144	1,252	758	1,769	2,466	1,628
South Carolina	4,009	4,972	4,232	5,395	4,031	3,822	3,494	5,018	4,206	3,597
Georgia	7,222	16,347	14,754	19,379	16,762	17,558	21,882	25,998	16,545	9,003
Florida	4,317	[3] 6,355	7,190	6,384	6,485	9,195	10,479	8,682	9,561	5,364
Alabama	1,256	2,278	1,880	1,943	1,379	769	722	1,056	978	874
Mississippi	75	198	219	208	182	197	251	206	139	34
Arkansas	190	352	411	471	321	347	439	270	312	173
Oklahoma	66	205	141	249	429	513	538	511	244	73
Texas	5,369	6,513	3,157	6,314	5,619	6,450	4,460	6,050	4,107	3,159
Washington	175	215	259	191	200	261	307	239	192	140
California	4,054	4,305	4,522	6,278	5,221	5,589	6,366	6,282	6,241	4,337
Other States	1,221	955	1,294	931	547	562	700	502	510	468

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included. See Table 250 for United States totals.

[1] Crop-movement season extends from Apr. 1 through November of a given year.
[2] Preliminary.
[3] Includes 2 cars reported as shipped in January.

TABLE 252.—*Watermelons, Tom Watson: Price per car to jobbers, Chicago and New York, 1924–1932* [1]

Market and season	June	July	August	Market and season	June	July	August
Chicago:	*Dollars*	*Dollars*	*Dollars*	New York:	*Dollars*	*Dollars*	*Dollars*
1924	576	249	291	1924	474	[2] 270	[2] 273
1925	576	362	[3] 211	1925	[2] 512	[2] 311	202
1926	623	281	[3] 202	1926	460	248	180
1927	471	289		1927	435	289	237
1928	445	301	252	1928	378	262	216
1929	365	339		1929	308	278	[3] 234
1930	511	271	269	1930	469	214	211
1931	426	273		1931	[4] 427		
1932	363	259		1932	236	216	184

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simply averages of daily range of selling prices.

[1] Quotations are for southeastern, 22 to 26 pound average.
[2] Auction sales.
[3] Thurmond Gray.
[4] Less than 10 quotations.

TABLE 253.—*Frozen and preserved fruits: Cold-storage holdings, 1923–24 to 1932–33*

Year	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923–24		9,818	17,749	18,756	20,247	17,423	16,458	15,588	11,549	11,244	9,692	7,519
1924–25	9,695	20,525	33,918	37,472	38,001	36,501	34,688	34,610	33,827	21,758	19,810	17,016
1925–26	19,168	24,259	28,702	28,356	25,564	24,640	22,624	24,054	21,592	19,124	16,368	13,370
1926–27	23,347	39,421	50,941	59,825	57,990	56,088	54,189	50,773	48,921	45,716	43,455	39,147
1927–28	41,075	57,670	62,974	65,352	62,412	61,840	56,971	54,661	52,196	43,945	40,137	36,659
1928–29	38,372	60,916	83,228	79,211	79,457	77,274	73,195	68,725	60,216	53,310	48,570	41,892
1929–30	42,285	56,539	64,863	64,993	61,348	61,752	57,860	54,942	48,065	41,723	38,554	82,535
1930–31	36,854	44,795	73,360	81,734	81,178	80,049	76,737	74,845	70,646	66,636	60,822	56,740
1931–32	66,358	88,979	110,223	107,271	103,427	99,234	96,074	92,305	88,819	82,283	78,162	72,194
1932–33	69,068	90,323	92,717	91,908	87,302	83,579	79,651					

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

TABLE 254.—*Fruits and vegetables: Unloads of 18 commodities at 12 markets, in car lots, 1931 and 1932 and total 1924–1932*

Commodity and calendar year	New York	Chicago	Philadelphia	Boston	Detroit	Pittsburgh	St. Louis	Los Angeles	Cleveland	Baltimore	Cincinnati	San Francisco
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Apples:												
1931	11,470	6,193	2,349	1,769	2,242	2,060	554	3,650	1,101	351	952	682
1932	9,775	4,638	2,158	2,036	1,459	1,641	858	3,548	817	292	1,155	659
Cabbage:												
1931	5,757	1,963	2,928	1,398	899	1,217	1,409	181	584	1,468	665	3
1932	4,426	1,456	2,234	977	653	1,166	1,307	14	477	1,179	592	13
Cantaloupes:[1]												
1931	9,184	2,942	2,332	1,972	1,141	1,547	802	380	1,078	627	647	500
1932	7,433	2,217	1,818	1,828	790	1,192	573	168	839	441	508	388
Celery:												
1931	4,177	1,560	1,639	819	824	882	565	86	403	714	385	344
1932	3,935	1,144	1,577	825	603	803	652	56	417	821	384	334
Grapefruit:												
1931	7,347	2,143	1,624	1,535	1,087	728	638	159	796	602	512	393
1932	4,943	1,891	1,310	998	734	507	556	20	555	468	426	330
Grapes:												
1931	11,637	3,213	2,647	3,244	899	1,722	541	56	519	461	417	2,080
1932	12,953	2,729	2,696	3,268	643	1,366	505	65	489	453	310	2,365
Lemons:												
1931	3,091	1,241	838	646	515	504	495	----	405	510	431	343
1932	2,856	1,068	795	583	454	395	421	8	348	487	424	249
Lettuce:												
1931	8,771	4,341	3,162	1,942	1,562	1,259	1,344	835	1,127	849	652	204
1932	8,019	3,915	3,159	1,924	1,430	1,210	1,340	296	1,179	881	685	298
Onions:												
1931	6,764	1,897	2,161	1,877	850	934	853	862	631	609	450	901
1932	6,057	1,738	1,998	1,927	966	1,033	879	390	656	610	386	539
Oranges:												
1931	19,040	6,323	5,546	5,651	2,851	2,336	1,701	99	2,191	1,802	1,454	1,167
1932	17,607	6,128	5,444	5,556	2,555	2,094	1,704	43	2,123	1,742	1,587	647
Peaches:												
1931	5,530	2,901	1,220	1,474	1,632	950	455	669	878	312	837	444
1932	2,314	782	396	771	450	459	290	233	262	127	447	432
Pears:												
1931	5,557	1,364	928	707	371	433	149	491	299	242	127	456
1932	4,635	974	876	620	259	436	189	288	192	265	158	263
Plums and prunes, fresh:												
1931	1,674	435	303	226	145	100	54	42	115	60	79	19
1932	1,776	527	310	262	144	85	155	46	108	91	85	16
Potatoes:												
1931	20,368	16,408	7,537	7,898	6,573	3,999	4,647	6,429	3,900	3,057	3,178	3,651
1932	17,295	14,779	6,125	8,024	3,391	3,211	4,345	5,897	2,631	2,929	2,738	3,810
Strawberries:												
1931	1,869	1,371	439	853	677	389	289	89	411	182	484	9
1932	1,497	1,209	394	897	704	371	236	219	453	113	471	18
Sweetpotatoes:												
1931	1,121	1,639	286	879	779	904	164	205	660	581	535	36
1932	754	1,339	100	919	746	868	81	199	676	464	551	26
Tomatoes:												
1931	6,692	2,585	1,860	1,787	1,146	1,332	689	417	265	915	450	330
1932	6,931	2,269	2,097	1,904	988	1,259	595	588	201	984	478	234
Watermelons:												
1931	3,632	2,806	1,643	692	1,354	852	1,728	1,966	1,079	1,397	1,502	406
1932	2,798	1,859	1,222	647	828	622	1,043	1,630	544	1,257	797	346
Total:[2]												
1924	122,744	56,079	35,874	32,937	13,589	21,124	14,384	14,976	16,082	12,843	12,278	11,516
1925	125,609	57,782	35,229	30,119	17,980	20,416	15,181	15,164	15,541	11,977	11,785	13,095
1926	128,667	59,349	35,383	30,513	20,553	21,075	16,278	16,244	16,380	12,672	11,976	14,121
1927	139,463	64,617	35,970	35,588	22,679	21,434	16,523	16,012	16,825	12,534	12,213	14,648
1928	140,142	65,405	34,905	38,773	23,872	21,688	15,599	17,135	16,430	12,397	12,424	14,202
1929	141,634	64,141	38,180	37,582	27,918	26,010	17,452	17,817	17,913	13,309	13,019	12,965
1930	137,686	61,982	41,590	34,360	26,287	25,450	17,884	18,039	16,651	15,356	14,126	13,387
1931	133,681	61,325	39,442	35,369	25,547	22,148	17,077	16,616	16,442	14,739	13,757	12,058
1932	116,604	50,662	34,718	33,966	17,797	18,718	15,729	13,717	12,967	13,574	12,182	10,967

Bureau of Agricultural Economics. Compiled from daily reports made by common carriers to bureau representatives in the various markets. Unloads as shown in car lots include those by boat and less than car lots reduced to car-lot basis. This table not comparable with table published in former Yearbooks.

[1] Includes Honeydews and other miscellaneous melons.
[2] Totals include: 1924–1926, 16 commodities; beginning 1927, 18 commodities.

TABLE 255.—*Fruits and vegetables: Unloads of truck receipts of specified commodities in seven markets, in car-lot equivalents, 1931 and 1932*

Commodity and year	Boston	Denver	Los Angeles	New York	Philadelphia	Salt Lake City	San Francisco
Apples:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1931	1,568	17	266	2,300	1,853	124	373
1932	1,561	65	430	3,059	2,075	152	411
Beans, snap:							
1931	------	45	983	1,675	1,036	50	253
1932	571	90	1,020	2,500	1,203	48	266
Cabbage:							
1931	509	97	1,099	1,771	691	76	322
1932	659	117	1,314	3,522	1,023	75	298
Cantaloupes: [1]							
1931	2	173	2,331	829	1,173	204	496
1932	4	183	2,351	1,305	1,646	201	630
Carrots:							
1931	------	59	1,980	965	474	136	352
1932	840	146	2,147	847	641	86	432
Celery:							
1931	388	160	2,469	742	265	94	399
1932	346	170	2,801	1,095	438	87	535
Corn, green:							
1931	------	190	1,031	2,901	2,020	74	341
1932	786	164	1,264	5,016	2,012	87	377
Cucumbers:							
1931	------	53	469	775	404	61	72
1932	246	63	464	822	431	52	88
Grapes:							
1931	35	0	1,455	205	222	26	325
1932	72	7	1,898	188	206	51	402
Lettuce: [2]							
1931	1,054	206	3,415	1,214	412	110	1,300
1932	1,067	237	4,070	1,603	353	150	1,439
Onions:							
1931	83	62	565	1,519	212	85	49
1932	170	61	709	1,626	233	98	92
Peaches:							
1931	25	0	1,446	1,833	1,824	126	354
1932	120	3	1,517	1,992	1,514	149	424
Pears:							
1931	50	0	504	222	45	18	133
1932	67	9	407	383	120	47	124
Peppers:							
1931	------	52	------	1,152	541	32	130
1932	160	112	361	1,407	617	30	125
Plums and prunes:							
1931	0	0	267	5	2	24	71
1932	2	------	323	36	27	32	75
Potatoes:							
1931	99	499	1,870	4,579	3,571	574	269
1932	220	346	1,577	5,668	4,706	511	169
Spinach:							
1931	909	62	1,143	1,726	1,005	54	434
1932	883	96	1,343	2,068	949	60	478
Strawberries:							
1931	160	46	628	609	1,083	68	286
1932	270	77	827	1,080	1,353	141	386
Sweetpotatoes:							
1931	0	0	625	1,647	1,879	1	149
1932	1	------	515	2,201	2,123	2	163
Tomatoes:							
1931	376	109	2,755	1,917	1,474	225	667
1932	653	125	3,342	2,652	2,228	214	744
Watermelons:							
1931	0	17	763	17	328	66	23
1932	------	32	572	43	479	53	52

Bureau of Agricultural Economics. Compiled from reports made by bureau representatives in the various markets.

[1] Includes Casabas, Honeydews, Honey Balls, etc. [2] Includes Romaine.

STATISTICS OF MISCELLANEOUS CROPS

TABLE 256.—*Beans, dry, edible:*[1] *Acreage, production, value, exports, etc., United States, 1899, 1909, 1914–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per bag of 100 pounds received by producers, Dec. 1[2]	Farm value, basis Dec. 1 farm price	Wholesale price at Chicago[3]	Imports, year beginning July[4]	Domestic exports, year beginning July[4][5]
	1,000 acres	*Pounds*	*1,000 bags*[6]	*Dollars*	*1,000 dollars*	*Dollars*	*1,000 bushels*	*1,000 bushels*
1899	*454*	*669.3*	*3,038*			1.23	(7)	
1909	*803*	*840.7*	*6,751*			2.27	1,015	
1914	875	794.4	6,951	3.77	26,213	1.33	906	
1915	928	667.3	6,193	4.32	26,771	1.91	663	
1916	1,107	580.8	6,429	8.51	54,686	2.54	3,748	
1917	1,821	528.7	9,627	10.84	104,350	5.45	4,146	1,517
1918	1,744	598.6	10,438	8.80	91,863	6.89	4,016	4,489
1919	*1,162*	*787.0*	*8,447*					
1919	1,077	752.0	8,099	6.32	51,203	4.75	3,806	1,993
1920	913	661.8	6,042	4.33	26,179	4.06	824	1,216
1921	861	706.7	6,085	3.91	23,767	2.77	520	1,100
1922	1,129	699.8	7,901	5.16	40,797	4.48	2,623	602
1923	1,322	725.2	9,587	5.26	50,382	4.22	886	675
1924	1,582	587.7	9,298	5.10	47,416	3.28	1,421	540
1925	1,614	728.6	11,760	4.87	57,263	3.70	1,271	576
1926	1,611	646.2	10,410	4.67	50,731	2.97	1,051	529
1927	1,450	629.0	9,120	4.80	43,749	[8] 3.31	2,465	427
1928	1,535	642.7	9,866	6.91	68,154	5.40	1,505	316
1929	[9] *1,746*	*699.4*	*12,212*					
1929	1,836	666.7	12,240	[10] 6.77	[11] 79,318	5.86	2,534	296
1930	2,110	658.8	13,900	[10] 4.21	[11] 56,777	3.98	1,386	271
1931	1,883	672.4	12,662	[10] 2.14	[11] 25,477	2.72	222	158
1932[12]	1,348	748.9	10,095	[10] 1.73	[11] 16,682	1.48		

Bureau of Agricultural Economics. Italic figures are census returns; census figures include all States; other figures, estimates of Crop Reporting Board, principal producing States only, revised, 1919 to 1928. *See introductory text.*

[1] Table includes, besides the ordinary edible beans and Limas, the Blackeye of California which is identical with the blackeyed pea of the South. Soybeans not included.
[2] Farm prices are as of Nov. 15, 1914–1924.
[3] Prices 1899 and 1909 from Chicago Board of Trade annual reports, quotations for navy, good to choice; 1914–1932 from Daily Trade Bulletin, pea beans (quoted per 100 pounds; converted to bushel of 60 pounds).
[4] Imports and exports compiled from Commerce and Navigation of the United States, 1910–1917; Foreign Commerce and Navigation of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932; and official records of the Bureau of Foreign and Domestic Commerce.
[5] Not separately reported prior to 1918.
[6] Bags of 100 pounds. Computed from bushels of 60 pounds.
[7] Not separately reported.
[8] *11 months.*
[9] *Acreage grown alone.*
[10] Weighted average price for crop marketing season.
[11] Based on weighted average price for crop marketing season.
[12] Preliminary.

TABLE 257.—*Beans, dry, edible:*[1] *Acreage, yield, production, and weighted average price, by States, averages, and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Weighted average price per bag of 100 pounds, crop marketing season	
	Average, 1924–1928	1931	1932[2]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[2]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 bags*[3]	*1,000 bags*[3]	*1,000 bags*[3]	*Dollars*	*Dollars*
Maine	6	10	8	[4] 876	840	780	51	84	62	4.40	3.60
Vermont	4	4	3	[4] 672	600	570	25	24	17	4.10	3.20
New York	109	120	114	814	1,080	750	810	1,296	855	2.30	1.70
Michigan	525	614	479	707	540	888	3,611	3,316	4,254	1.80	1.10
Wisconsin	9	7	6	517	240	390	45	17	23	2.80	2.00
Minnesota	7	7	7	618	390	360	46	27	25	3.50	2.60
Nebraska	5	14	14	520	450	720	26	63	101	3.20	1.90
Kansas		9	7		330	360		30	25	2.80	1.80
Montana	25	37	24	[5] 823	960	1,080	219	355	259	1.80	1.30
Idaho	84	178	93	957	1,170	1,140	875	2,083	1,060	1.70	1.30
Wyoming	15	37	18	697	1,020	900	114	377	162	1.70	1.50
Colorado	342	342	178	356	245	180	973	838	320	1.40	1.60
New Mexico	150	161	163	382	400	250	566	644	408	1.60	1.80
Arizona	6	8	8	438	420	460	28	34	36	3.10	2.90
Oregon		1	1		720	450		7	4	3.80	2.90
California	271	334	225	904	1,038	1,104	2,697	3,467	2,484	2.90	3.00
United States	1,558	1,883	1,348	678.0	672.4	748.9	10,091	12,662	10,095	2.14	1.73

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Table includes, besides the ordinary edible beans and Limas, the Blackeye of California which is identical with the blackeyed pea of the South. Soybeans not included.
[2] Preliminary.
[3] Bags of 100 pounds.
[4] 5-year average.
[5] 7-year average.

TABLE 258.—*Beans, dry, edible:*[1] *Production by varieties, 100-pound bags, United States, 1929–1932*

Year	Pea	White Marrow	Great Northern	Yellow Eye	White Kidney	Red Kidney[2]	Small Red	Pinto	Pink
	1,000 bags	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*
1929	3,342	135	1,763	104	42	418	395	2,303	644
1930	2,838	166	2,114	81	39	345	520	3,115	680
1931	3,738	277	2,062	144	117	610	505	1,411	510
1932[3]	4,631	92	1,126	76	53	350	256	753	536

Year	Small White	Large White	Standard Lima	Baby Lima	Blackeye	Cranberry	Bayo	Other[4]	Total
1929	416	21	987	486	515	107	12	550	12,240
1930	489	24	1,102	696	852	120	16	703	13,900
1931	429	15	1,064	663	459	147	20	491	12,662
1932[3]	226	4	872	322	275	71	3	443	10,095

Bureau of Agricultural Economics. Based upon reports by growers on proportion of total production made up of each variety, supplemented by investigations of field statisticians.

[1] Table includes, besides the ordinary edible beans and Limas, the Blackeye of California, which is identical with the blackeyed pea of the South. Soybeans not included.
[2] Including Michigan production of Dark Red Kidney beans, 69 in 1930, 76 in 1931 and 85 in 1932.
[3] Preliminary.
[4] Including garden or seed beans in Idaho, Wyoming, and Colorado.

TABLE 259.—*Beans, dry edible:*[1] *Production in specified countries, bags of 100 pounds, average 1921–22 to 1925–26, annual 1929–30 to 1932–33*

Country	Average, 1921–22 to 1925–26	1929–30	1930–31	1931–32	1932–33
	1,000 bags	*1,000 bags*	*1,000 bags*	*1,000 bags*	*1,000 bags*
Canada	736	895	863	782	636
United States	8,026	12,240	13,900	12,662	10,095
Mexico	2,600	2,094	1,774	2,870	2,583
England and Wales	3,787	2,462	3,118	2,690	2,647
Scotland	75	60	76	59	57
Netherlands	327	336	429	307	
France	2,410	2,249	3,119	3,284	2,287
Italy	2,345	3,468	3,490	2,092	3,050
Spain	3,398	3,438	3,631	3,427	
Germany		272	255	240	239
Czechoslovakia	273	247	214	198	204
Austria	162	272	276	246	[2] 262
Hungary	810	1,023	1,017	1,335	[2] 902
Yugoslavia	[4] 1,748	2,068	3,852	2,205	[2] 2,205
Rumania	4,081	5,711	4,476	7,284	7,286
Bulgaria	1,055	1,121	1,364	1,917	[2] 1,786
Greece	[4] 175	130	169	258	
Japan [5]	1,513	2,156	2,919	1,485	1,179
Chosen	[6] 118	89	103	70	
Brazil	[6] 12,519	14,536	14,868		
Chile	969	1,691	1,408	1,454	
Madagascar	[4] 392	380	233	837	351
Total countries reporting, all periods	31,513	36,440	40,191	40,046	36,520
Total, all countries		56,947	61,054		

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Figures are for the harvesting seasons 1921 to 1932 in the Northern Hemisphere and 1921–22 to 1932–33 in the Southern Hemisphere.

[1] Excluding soy, mung, adzuki, broad, and horse beans and similar classes not commonly used as edible beans in the United States.
[2] Preliminary.
[3] Unofficial estimate.
[4] 4-year average.
[5] Production in Hokkaido Province, where most of the dry edible bean varieties are grown.
3-year average.

TABLE 260.—*Beans, dry, edible: Car-lot shipments, by State of origin, 1922–23 to 1931–32*

State	Crop movement season [1]									
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [2] [3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	1,650	1,969	1,900	1,158	916	614	889	1,056	961	1,810
Michigan	5,477	8,333	7,848	10,506	8,699	4,989	6,383	5,616	5,046	6,390
Montana	44	104	124	288	280	386	566	733	647	400
Idaho	351	749	1,336	1,898	1,437	2,074	1,973	2,616	2,671	2,412
Wyoming		9	31	82	130	252	347	577	785	497
Colorado	427	1,732	1,316	2,927	1,866	1,711	1,732	2,347	4,312	1,873
New Mexico	75	146	388	170	412	608	555	1,750	624	857
California	3,774	2,951	1,847	2,558	3,433	3,251	2,961	3,588	2,850	2,210
Other States	46	100	134	138	114	55	122	230	357	215
Total	*11,844*	*16,093*	*14,924*	*19,725*	*17,287*	*13,940*	*15,528*	*18,422*	*18,253*	*16,664*

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis. Shipments by truck not included.

[1] Crop-movement season extends from September of one year through August of the following year.
[2] Preliminary.
[3] *Beginning September, 1932, shipments are reported in bags of 100 pounds each. Data include all shipments originating at shipping points whether in car lots or less than car lots, and the figures therefore will not be comparable with those in this table, which are for car-lot shipments only.*

TABLE 261.—*Beans, dry, edible: Average price per 100 pounds, 1923–24 to 1932–33*

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
PEA (NEW YORK AND MICHIGAN HAND PICKED), BOSTON [1]													
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	7.40	7.75	7.79	7.12	7.06	7.40	7.30	7.28	7.12	7.12	7.16	7.68	7.35
1924–25	8.04	8.18	8.10	8.00	6.94	7.20	6.91	6.60	6.31	6.34	6.17	5.89	7.06
1925–26	5.50	5.49	5.86	5.90	5.67	5.49	5.32	5.06	5.01	5.48	5.65	5.48	5.49
1926–27	5.28	5.98	6.32	6.11	5.86	5.66	5.38	5.28	5.46	6.29	6.48	6.62	5.89
1927–28	6.34	6.18	6.12	6.16	6.69	7.88	8.71	9.81	10.08	10.18	10.30	10.22	8.22
1928–29	9.94	9.75	9.55	9.50	9.95	10.97	11.13	10.41	10.45	10.38	9.97	10.32	10.19
1929–30	10.56	10.12	8.66	8.09	8.12	8.00	7.62	7.12	7.22	7.31	7.02	7.81	8.14
1930–31	8.25	7.12	6.38	6.32	6.19	5.75	5.66	5.55	5.25	5.06	4.98	4.91	5.95
1931–32	4.62	4.25	4.19	3.62	3.19	3.06	2.88	2.75	2.62	2.58	2.71	3.11	3.30
1932–33	3.18	2.53	2.39	2.18	-----	-----	-----	-----	-----	-----	-----	-----	-----
SMALL WHITE, SAN FRANCISCO [2]													
1923–24	6.75	6.05	6.09	5.92	5.92	6.18	6.03	6.02	6.04	6.29	7.04	7.29	6.33
1924–25	7.86	8.00	7.89	7.18	7.22	7.71	7.54	7.49	7.38	7.31	7.42	7.42	7.54
1925–26	7.32	6.20	5.71	5.98	6.26	6.25	5.97	5.87	5.62	5.57	5.83	5.95	6.04
1926–27	5.66	5.89	5.94	5.81	5.83	5.85	5.86	6.34	7.17	8.26	8.57	8.58	6.65
1927–28	7.75	5.60	5.88	5.80	6.21	6.66	8.42	9.20	9.28	9.03	8.75	8.36	7.58
1928–29	7.15	8.11	8.40	8.52	9.23	9.99	9.90	9.59	9.45	9.45	10.59	-----	-----
1929–30	-----	8.67	8.55	8.06	7.38	7.83	8.12	7.87	7.83	7.64	7.43	6.99	-----
1930–31	7.02	6.09	5.20	4.86	4.56	4.51	4.28	4.24	4.27	4.02	3.67	3.73	4.70
1931–32	3.56	2.98	3.38	3.12	2.92	2.58	2.48	2.34	2.21	2.25	2.35	2.63	2.73
1932–33	2.99	2.73	2.60	2.59	-----	-----	-----	-----	-----	-----	-----	-----	-----
LIMA, CALIFORNIA, NEW YORK [1]													
1923–24	9.40	9.84	10.41	10.09	10.81	11.30	12.40	12.68	12.48	12.59	12.62	13.04	11.47
1924–25	13.62	14.42	14.12	13.89	14.41	15.00	14.79	14.85	14.94	15.27	15.79	16.27	14.78
1925–26	15.92	14.11	13.24	11.88	11.83	12.06	11.20	10.13	9.15	8.88	8.76	8.55	11.31
1926–27	8.94	8.44	7.68	7.01	7.14	6.94	6.97	6.97	6.86	6.74	6.68	6.67	7.25
1927–28	6.96	6.97	6.85	6.83	7.00	7.87	8.33	9.06	9.69	9.75	9.90	10.17	8.28
1928–29	9.90	9.76	10.56	12.01	12.61	13.42	13.50	13.50	14.40	15.25	15.90	16.17	13.08
1929–30	16.76	14.39	13.27	12.95	12.28	12.07	12.71	12.71	12.67	12.45	12.01	11.95	13.02
1930–31	12.05	9.90	8.74	7.37	7.58	7.94	7.56	7.50	7.40	6.55	5.98	6.29	7.90
1931–32	6.08	5.78	5.88	5.50	5.10	4.56	4.26	4.26	4.28	4.40	4.49	4.96	4.96
1932–33	5.41	5.41	4.86	4.63	-----	-----	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Compiled from the Boston Produce Market Report, weekly; San Francisco Commercial News, daily; and New York Producers Price Current, daily. See 1930 Yearbook, pp. 794–795, for data for earlier years.

[1] Prices represent prevailing values of the commodity and grade specified, as indicated by sales from receivers to wholesale distributors.

[2] Quotations for shipment f. o. b. rail California.

TABLE 262.—*Soybeans: Production in specified countries, 1922–23 to 1932–33*

Crop year	United States	Manchuria [1]	Chosen	Japan	Dutch East Indies
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1922–23	[2] 4,329	109,067	23,117	18,624	3,858
1923–24	[2] 6,541	88,867	23,760	17,578	3,574
1924–25	[2] 5,680	92,667	18,723	16,596	3,536
1925–26	[2] 5,102	116,667	23,609	18,473	3,933
1926–27	[2] 6,517	135,000	22,276	12,512	3,672
1927–28	[2] 7,459	163,319	24,300	16,704	3,971
1928–29	8,688	177,804	19,510	15,239	4,303
1929–30	8,670	178,389	20,434	13,592	3,917
1930–31	12,217	193,564	22,989	15,531	4,693
1931–32	15,271	192,058	21,155	-----	4,720
1932–33	13,245	[3] 163,118	[3] 22,293	-----	-----

Bureau of Agricultural Economics. Compiled from official sources.

[1] Manchuria produces about 97 per cent of the soybean production of China. Production figures for China are not available.

[2] Subject to revision.

[3] Preliminary.

TABLE 263.—*Soybeans:*[1] *Acreage, yield, production, and value, by States, 1931 and 1932*

State	Beans gathered: Acreage[2] 1931	Beans gathered: Acreage[2] 1932[5]	Beans gathered: Yield per acre 1931	Beans gathered: Yield per acre 1932	Beans gathered: Production 1931	Beans gathered: Production 1932[5]	Total acreage (except for hay)[3] 1931	Total acreage (except for hay)[3] 1932[5]	Total production[3] 1931	Total production[3] 1932[5]	Weighted average price per bushel, crop-marketing season 1931	Weighted average price per bushel, crop-marketing season 1932	Value of total production (except hay), basis weighted average price for crop marketing season[4] 1931	Value of total production (except hay), basis weighted average price for crop marketing season[4] 1932
	1,000 acres	*1,000 acres*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 acres*	*1,000 acres*	*1,000 bush.*	*1,000 bush.*	*Dollars*	*Dollars*	*1,000 dolls.*	*1,000 dolls.*
Ohio	*28*	*25*	*20.0*	*15.5*	*560*	*388*	*28*	*25*	*560*	*388*	*0.49*	*0.37*	*274*	*144*
Indiana	171	138	17.8	16.0	3,044	2,208	171	138	3,044	2,208	.36	.39	1,096	861
Illinois	350	315	18.0	20.0	6,300	6,300	350	315	6,300	6,300	.35	.39	2,205	2,457
Michigan	2	2	12.0	13.0	24	26	2	2	24	26	.61	.46	15	12
Wisconsin	2	5	10.0	12.0	20	60	2	5	20	60	1.35	.46	27	28
Iowa	47	60	15.5	18.0	728	1,080	47	60	728	1,080	.51	.40	371	432
Missouri	90	73	12.0	12.5	1,080	912	90	73	1,080	912	.61	.48	659	438
Kansas	12	11	9.0	7.3	108	80	12	11	108	80	.61	.52	66	42
Delaware	26	27	14.0	9.0	364	243	26	27	364	243	.54	.55	197	134
Maryland	7	6	13.5	12.0	94	72	7	6	94	72	.77	.65	72	47
Virginia	20	16	14.0	10.0	280	160	33	33	462	330	.72	.58	333	191
West Virginia	*1*	*1*	*12.0*	*10.0*	*12*	*10*	*3*	*3*	*36*	*30*	*1.70*	*1.22*	*61*	*37*
North Carolina	*107*	80	14.0	*12.0*	1,498	960	253	230	3,542	2,760	.70	.49	2,479	1,352
South Carolina	10	7	9.5	10.5	96	74	34	26	323	262	1.19	.70	384	183
Georgia	15	6	9.5	10.0	142	60	18	13	171	130	1.73	1.34	296	174
Kentucky	7	7	13.5	14.0	94	98	24	22	324	308	.90	.70	292	216
Tennessee	22	18	7.5	7.0	165	126	22	18	165	126	.93	.76	153	96
Alabama	8	7	11.5	14.0	92	98	16	10	184	140	1.26	1.12	232	157
Mississippi	15	8	15.0	11.0	225	88	26	25	390	275	1.21	1.05	472	289
Arkansas	8	4	14.5	13.0	116	52	11	12	160	156	1.17	.81	187	126
Louisiana	16	11	10.6	10.4	170	114	103	98	1,092	1,019	1.63	1.28	1,780	1,304
Oklahoma	6	3	10.0	12.0	60	36	7	4	70	48	1.11	1.02	78	49
United States	*970*	*830*	*15.7*	*16.0*	*15,271*	*13,245*	*1,285*	*1,165*	*19,241*	*16,953*	*.61*	*.52*	*11,729*	*8,769*

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Soybeans planted in corn in Northern States not included. For Southern States such acreage is included reduced to its equivalent solid acreage.
[2] Solid equivalent of acres from which the soybeans were gathered.
[3] Soybeans grazed or hogged off in Northern States not included. For Southern States such acreage is included.
[4] Total production (except hay) multiplied by price to give total value.
[5] Preliminary.

TABLE 264.—*Soybeans: Estimated average price per bushel, received by producers, United States, 1922–23 to 1932–33*

Crop year	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1922–23	1.89	2.06	1.97	2.07	2.13							2.25	2.01
1923–24	2.09	2.11	2.11	2.23	2.26	2.41	2.40	2.44	2.49	2.60	2.51	2.33	2.28
1924–25	2.23	2.16	2.36	2.59	2.64	2.76	2.77	2.81	2.70	2.71	2.40	2.38	2.49
1925–26	2.27	2.18	2.17	2.38	2.33	2.39	2.27	2.37	2.67	2.71	2.31	2.27	2.35
1926–27	1.97	1.85	1.83	1.90	2.03	1.98	2.07	2.15	2.20	2.14	2.06	1.91	2.00
1927–28	1.86	1.70	1.61	1.70	1.69	1.85	1.93	2.06	2.13	2.12	2.01	1.89	1.84
1928–29	1.72	1.69	1.70	1.82	1.93	2.13	2.19	2.30	2.41	2.46	2.15	1.87	1.92
1929–30	1.79	1.70	1.73	1.85	1.91	2.00	2.07	2.11	2.16	1.96	1.90	1.80	1.90
1930–31	*1.64*	*1.48*	*1.44*	*1.46*	*1.40*	1.42	*1.38*	1.39	1.29	*1.12*	.94	.82	1.42
1931–32	*.56*	*.52*	*.61*	*.62*	*.59*	*.66*	*.65*	*.64*	*.61*	*.58*	*.58*	*.57*	*.60*
1932–33	.55	.45	.44										

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by estimated monthly marketings. For previous data see 1930 or earlier Yearbooks.

TABLE 265.—*Soybeans and soybean oil: International trade, average 1925–1929, annual 1929–1931*

SOYBEANS

Country	Calendar year							
	Average 1925-1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
China [2]	3,731,214	0	5,468,725	0	3,810,478	0	5,074,744	0
PRINCIPAL IMPORTING COUNTRIES								
Germany	0	1,390,622	0	2,257,198	0	1,959,417	0	2,236,727
Japan	5,574	1,015,825	5,692	1,251,723	4,899	946,238	4,448	1,210,627
Denmark	0	394,965	0	518,753	0	388,591	0	523,993
United Kingdom	0	305,643	0	454,689	0	204,532	0	247,072
Sweden	0	166,799	0	221,231	2	108,317	0	68,753
Italy	[3] 42	97,395	110	194,652	10	17,734	0	88,820
Netherlands	*1,192*	*58,510*	487	*108,305*	329	42,398	*1,182*	70,952
United States [4]	0	4,064	0	4,337	0	3,852	[5] 0	3,544
Total	6,808	3,433,823	6,289	5,010,888	5,240	3,671,079	5,630	4,460,488

SOYBEAN OIL

Country	Average 1925-1929 Exports	Average 1925-1929 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL EXPORTING COUNTRIES								
China	244,894	0	148,673	0	251,909	0	196,119	0
Germany	45,828	30,004	103,862	4,376	49,520	28,833	55,137	20,441
Denmark	36,742	3,670	43,690	699	28,609	2,084	40,937	1,764
Japan	14,393	323	14,739	[6] 500	34,156	[6] 214	16,009	0
Sweden	12,917	10,182	15,911	10,433	4,916	13,254	2,312	24,302
Total	354,774	44,179	326,875	16,008	369,110	44,385	310,514	46,507
PRINCIPAL IMPORTING COUNTRIES								
Netherlands	40,024	109,176	23,888	93,739	22,999	124,768	24,140	62,175
United Kingdom	49,042	75,917	40,347	33,038	35,058	56,529	32,294	62,265
United States	4,528	19,545	7,967	19,489	4,962	8,348	4,551	4,916
France	159	17,401	345	15,790	6	23,978	0	7,337
Morocco	0	[7] 9,855	0	10,657	0	5,430	0	9,911
Algeria	19	*6,394*	23	*133*	[6] *22*	*11*	----------	*2*
Austria	17	6,011	45	9,887	0	6,024	1	6,062
Total	94,689	244,299	72,615	182,733	63,047	225,088	60,986	152,668

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] These figures are for yellow beans, including mostly soybeans according to Agricultural Commissioner Paul O. Nyhus.
[3] 3-year average.
[4] Imports for consumption.
[5] Domestic exports of soybeans are not separately reported in Foreign Commerce and Navigation of the United States; if any, included with exports of "oilseeds." Soybeans inspected for exports began in October, 1931, there being 7,978,800 pounds exported from October to December.
[6] International Yearbook of Agricultural Statistics.
[7] 4-year average.

TABLE 266.—*Soybeans for seed: Average wholesale selling price per bushel at Baltimore and St. Louis, 1923–1932*

Year	Baltimore						St. Louis					
	Jan.	Feb.	Mar.	Apr.	May	Average	Jan.	Feb.	Mar.	Apr.	May	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	2.40	2.40	2.40	2.30	2.25	2.35	3.00	2.85	2.70	2.70	2.95	2.84
1924	2.10	2.40	2.40	2.70	3.00	2.52	2.80	2.80	2.80	2.80	2.75	2.79
1925	2.85	2.95	3.15	2.95	2.35	2.85	2.40	2.40	2.40	2.25	2.10	2.31
1926	2.00	2.05	2.10	2.15	2.75	2.21	2.15	2.15	2.30	2.55	2.90	2.41
1927	1.80	1.80	1.80	1.80	1.85	1.81	2.70	2.70	2.40	2.50	2.70	2.60
1928	1.95	1.90	1.95	1.95	2.15	1.98	1.80	1.80	1.85	2.00	2.25	1.94
1929	2.25	2.35	2.40	2.40	2.70	2.42	2.55	2.55	2.60	2.75	2.85	2.66
1930	2.10	2.10	2.10	2.25	2.65	2.24	2.15	2.25	2.25	2.25	2.25	2.23
1931	2.25	2.25	2.25	2.25	2.25	2.25	1.80	1.80	1.80	1.80	1.95	1.83
1932	.90	.90	.90	.90	.85	.89	1.05	1.05	.90	.90	.80	.94

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 267.—*Soybean oil: Quantity of beans crushed and quantity of crude oil produced, 1922–23 to 1931–32*

Year beginning October	Soybeans crushed					Oil produced				
	Oct.–Dec.	Jan.–Mar.	Apr.–June	July–Sept.	Total	Oct.–Dec.	Jan.–Mar.	Apr.–June	July–Sept.	Total
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1922–23	2,708	3,876	2,350	594	9,528	364	768	272	78	1,482
1923–24	2,230	3,232	564	102	6,128	286	388	72	13	759
1924–25	3,550	7,478	3,038	4,336	18,402	477	870	360	562	2,269
1925–26	5,486	7,746	7,450	358	21,040	728	990	874	46	2,638
1926–27	5,132	6,804	6,032	2,104	20,072	735	862	776	286	2,659
1927–28	8,788	10,278	8,792	5,654	33,512	1,164	1,289	1,132	789	4,374
1928–29	11,480	21,190	9,666	10,560	52,896	1,506	3,046	1,277	1,456	7,285
1929–30	39,658	25,288	20,716	14,324	99,986	5,231	3,343	2,905	1,945	13,424
1930–31	43,546	64,824	77,346	58,432	244,148	6,194	9,107	10,996	8,391	34,688
1931–32	77,606	101,834	65,488	38,570	283,498	10,655	14,620	9,257	5,405	39,946

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census, Animal and vegetable fats and oils.

TABLE 268.—*Soybean oil, domestic, crude: Wholesale price per pound, in barrels, at New York, by months, 1923–1932* [1]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	11.10	11.69	12.62	13.12	13.12	12.62	11.88	11.62	11.62	10.88	11.00	11.38
1924	11.62	12.50	12.50	11.75	12.38	12.00	12.38	12.50	12.75	12.25	13.12	13.38
1925	13.25	13.25	13.25	13.38	13.38	13.38	13.38	13.38	13.38	13.38	13.38	13.38
1926	13.38	13.38	13.38	13.38	13.38	13.50	14.00	14.00	14.00	14.00	13.00	12.00
1927	12.00	12.12	12.12	12.12	12.38	12.12	12.12	12.12	12.12	12.12	12.12	12.12
1928	12.12	12.12	12.12	12.12	12.12	12.38	12.38	12.38	12.38	12.38	12.38	12.38
1929	12.38	12.38	12.38	12.00	11.75	11.75	11.75	11.12	11.12	13.00	13.00	12.50
1930	11.75	11.50	10.72	10.40	10.64	10.80	10.72	10.38	10.18	9.30	8.50	8.30
1931	6.60	6.70	6.70	6.85	6.50	6.50	6.50	6.40	5.75	5.01	4.75	4.38
1932	4.09	3.85	3.85	3.85	3.76	3.50	3.50	3.50	3.50	3.70	3.55	3.50

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter. See 1930 Yearbook, p. 798, Table 300, for data for earlier years.

[1] Prior to 1930, prices are for the Saturday nearest the 15th of the month; beginning January, 1930, average of the Saturdays during the month.

TABLE 269.—*Cowpeas:* [1] *Acreage, yield, production, and value, by States, 1931 and 1932*

State	Peas gathered: Acreage [2] 1931	Acreage [2] 1932 [5]	Yield per acre 1931	Yield per acre 1932	Production 1931	Production 1932 [5]	Total acreage (except for hay) [3] 1931	Total acreage (except for hay) [3] 1932 [5]	Total production [3] 1931	Total production [3] 1932 [5]	Weighted average price per bushel, crop-marketing season 1931	Weighted average price per bushel, crop-marketing season 1932	Value of total production (except hay), basis weighted average price for crop marketing season [4] 1931	Value of total production 1932
	1,000 acres	*1,000 acres*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 acres*	*1,000 acres*	*1,000 bush.*	*1,000 bush.*	*Dollars*	*Dollars*	*1,000 dolls.*	*1,000 dolls.*
Indiana	6	7	10.5	7.5	63	52	6	7	63	52	0.65	0.51	41	27
Illinois	59	52	9.5	10.5	560	546	59	52	560	546	.57	.39	319	213
Missouri	18	21	11.5	8.8	207	185	18	21	207	185	1.01	.72	209	133
Kansas	1	1	6.0	5.5	6	6	1	1	6	6	.83	.83	5	5
Delaware	2	2	11.0	8.5	22	17	2	2	22	17	.77	.60	17	10
Maryalnd	1	2	10.0	8.5	10	17	1	2	10	17	1.02	.92	10	16
Virginia	7	8	11.0	7.0	77	56	13	19	143	133	1.04	.76	149	101
North Carolina	34	39	12.0	9.5	408	370	82	121	984	1,150	.85	.64	836	736
South Carolina	109	104	8.5	8.0	926	832	153	170	1,300	1,360	.76	.49	988	666
Georgia	80	96	9.5	9.2	760	883	136	174	1,292	1,601	.83	.52	1,072	833
Florida	8	8	9.8	8.5	78	68	21	21	206	178	1.40	1.08	288	192
Kentucky	6	11	11.5	10.0	69	110	16	27	184	270	.97	.71	178	192
Tennessee	36	37	5.5	4.7	198	174	36	37	198	174	.83	.64	164	111
Alabama	95	95	11.0	9.5	1,045	902	100	112	1,100	1,064	.73	.57	803	606
Mississippi	54	54	10.0	7.0	540	378	69	86	690	602	.81	.65	559	391
Arkansas	37	40	13.0	10.5	481	420	71	94	923	987	.84	.65	775	642
Louisiana	22	21	11.0	10.5	242	220	46	70	506	735	1.35	1.10	683	808
Oklahoma	20	17	11.0	11.0	220	187	35	40	385	440	1.11	.84	427	370
Texas	90	72	11.0	9.2	990	662	155	162	1,705	1,490	1.03	.75	1,756	1,118
United States	685	687	10.1	8.9	6,902	6,085	1,020	1,218	10,484	11,007	.88	.65	9,279	7,170

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Cowpeas planted in corn in northern States not included. For southern States such acreage is included reduced to its equivalent solid acreage.
[2] Solid equivalent of acres from which the cowpeas were gathered.
[3] Cowpeas grazed or hogged off in northern States not included. For southern States such acreage is included.
[4] Total production (except hay) multiplied by price to give total value.
[5] Preliminary.

TABLE 270.—*Cowpeas: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	2.08	1.87	1.94	1.95	2.01	2.12	2.21	2.32	2.46	2.58	2.82	2.86	2.30
1924–25	2.56	2.41	2.32	2.34	2.56	2.82	3.16	3.43	3.67	3.70	3.84	3.67	3.30
1925–26	3.24	3.12	2.93	2.98	2.87	3.03	3.21	3.37	3.50	3.43	3.47	3.47	3.25
1926–27	3.22	2.79	2.34	2.05	1.95	1.94	1.94	1.89	1.93	1.90	1.90	1.93	1.99
1927–28	1.84	1.80	1.70	1.72	1.65	1.71	1.74	1.76	1.86	2.00	2.09	2.09	1.90
1928–29	2.01	1.82	1.83	1.83	2.02	2.15	2.45	2.63	2.88	3.05	3.24	3.19	2.63
1929–30	2.99	2.49	2.30	2.22	2.28	2.40	2.59	2.73	2.85	2.93	3.00	2.93	2.64
1930–31	2.06	2.41	2.20	2.05	1.86	1.80	1.75	1.82	1.87	1.93	1.96	1.89	1.94
1931–32	1.63	1.27	.98	.93	.93	.92	.86	.88	.92	.76	.72	.67	.88
1932–33	.70	.67	.70	.63	.60								

Bureau of Agricultural Economics. Based upon returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by estimated monthly marketings. For previous data see 1930 or earlier Yearbooks.

TABLE 271.—*Cowpeas for seed: Average wholesale selling price per bushel at Baltimore and St. Louis, 1923–1932*

Year	Baltimore						St. Louis					
	Jan.	Feb.	Mar.	Apr.	May	Average	Jan.	Feb.	Mar.	Apr.	May	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	2.55	2.55	2.55	2.55	2.55	2.55	3.00	2.95	2.85	2.85	2.95	2.90
1924	3.00	3.30	3.15	3.40	3.45	3.26	2.75	2.95	3.00	3.05	3.55	3.06
1925	3.90	3.90	3.90	3.90	3.95	3.91	3.90	4.00	4.10	4.10	4.10	4.04
1926	4.25	4.25	4.25	4.25	4.20	4.24	4.50	4.45	4.20	4.10	4.05	4.26
1927	2.25	2.25	2.15	2.10	2.10	2.17	2.40	2.40	2.40	2.40	2.40	2.40
1928	1.80	1.80	2.05	2.20	2.30	2.03	2.40	2.40	2.40	2.50	2.70	2.48
1929	2.85	3.30	3.75	3.75	3.75	3.48	3.50	3.60	3.60	3.70	3.75	3.63
1930	3.30	3.30	3.30	3.30	3.30	3.30	3.15	3.15	3.15	3.10	3.00	3.11
1931	3.00	2.90	2.50	2.50	2.55	2.69	2.40	2.40	2.40	2.40	2.55	2.43
1932	1.05	1.10	1.10	1.10	1.00	1.07	1.20	1.20	1.10	1.05	1.05	1.12

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 272.—*Velvetbeans:*[1] *Acreage, yield, production, and December 1 price, by States, 1930–1932*

State	Acreage			Yield per acre			Total production			Price per ton received by producers Dec. 1		
	1930	1931	1932[2]	1930	1931	1932	1930	1931	1932[2]	1930	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*	*Dollars*
South Carolina	67	40	60	1,100	960	850	37	19	26	15.70	10.85	6.50
Georgia	604	506	663	880	660	870	266	167	288	13.50	9.70	4.50
Florida	122	127	140	650	800	600	40	51	42	13.00	9.35	4.25
Alabama	340	306	463	580	700	825	99	107	191	13.50	9.70	4.50
Mississippi	35	32	42	950	1,380	1,250	17	22	26	16.00	11.20	7.00
Louisiana	33	33	33	650	950	780	11	16	13	16.00	11.20	8.00
United States	1,201	1,044	1,401	782.7	731.8	836.5	470	382	586	13.78	9.86	4.76

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] The figures refer to the yield and entire production of velvetbeans in the hull. The pods are gathered from one-fourth to one-third of the acreage.
[2] Preliminary.

TABLE 273.—*Broomcorn: Acreage, production, and November 15 price, United States, 1915–1932*

Year	Acreage harvested	Average yield per acre	Production	Price per ton received by producers Nov. 15	Year	Acreage harvested	Average yield per acre	Production	Price per ton received by producers Nov. 15
	Acres	*Pounds*	*Short tons*	*Dollars*		*Acres*	*Pounds*	*Short tons*	*Dollars*
1915	307,000	449.2	68,900	225.91	1924	434,000	358.0	77,700	96.00
1916	305,000	320.6	48,800	167.11	1925	226,000	276.2	31,200	[1] 142.60
1917	394,000	329.6	65,000	172.68	1926	319,000	342.7	54,700	[2] 79.07
1918	408,000	330.2	67,400	218.22	1927	232,000	346.7	40,200	[2] 110.12
1919	*338,000*	*334.6*	*56,500*	----------	1928	299,000	360.7	53,800	[2] 104.54
1919	327,000	333.4	54,600	155.00	1929	*312,000*	*305.5*	*47,600*	----------
1920	266,000	283.9	37,800	127.54	1929	310,000	304.5	47,300	[3] 114.52
1921	222,000	352.8	39,200	71.63	1930	391,000	254.5	49,800	[3] 65.60
1922	275,000	278.1	38,200	219.27	1931	295,000	300.4	44,300	[3] 44.88
1923	536,000	303.2	81,400	160.17	1932[4]	285,000	234.9	33,500	[3] 42.09

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Revised, 1915 to 1928. See introductory text.

TABLE 274.—*Broomcorn: Acreage, yield, production, and weighted average price, by States, averages and annual 1931 and 1932*

State	Acreage harvested			Yield per acre			Production			Weighted average price per ton, crop-marketing season	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*
Illinois	33	28	21	519	580	550	7,880	8,100	5,800	59	65
Missouri	2	1	2	335	320	270	320	200	300	55	55
Kansas	35	24	25	345	290	210	5,900	3,500	2,600	39	38
Oklahoma	154	144	140	300	250	210	26,040	18,000	14,700	48	41
Texas	15	10	9	322	300	290	2,480	1,500	1,300	40	35
Colorado	30	45	46	340	250	200	4,620	5,600	4,600	36	34
New Mexico	32	43	42	304	345	200	4,290	7,400	4,200	32	27
United States	302	295	285	323.6	300.4	234.9	51,620	44,300	33,500	44.88	42.09

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 275.—*Broomcorn: Supply and distribution, 1925–26 to 1931–32*

Item	Year beginning June							
	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32	1932–33
Supply:								
Stocks June 1—	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
Manufacturers	20,960	16,201	18,173	18,744	19,591	14,980	17,088	14,890
Dealers [1]	25,043	9,706	11,498	5,938	7,495	6,667	4,566	7,159
On farms	6,024	3,265	2,709	1,206	823	1,043	2,326	3,151
Total carry-over	52,027	29,172	32,380	25,888	27,909	22,600	23,980	25,200
Production	31,200	54,700	40,200	53,800	47,300	49,800	44,300	[2] 33,500
Imports	(3)	(3)	193	(3)	(3)	(3)	(3)	-------
Total supply available	83,227	83,872	72,773	79,688	75,209	72,490	68,280	[5] 58,700
Distribution:								
Exports [4]	4,688	4,701	4,367	4,931	4,985	4,557	3,713	-------
Domestic use	49,367	46,791	42,518	46,848	47,534	43,953	39,367	-------
Stocks on hand May 31	29,172	32,380	25,888	27,909	22,690	23,980	25,200	-------

Bureau of Agricultural Economics.

[1] Storage stocks reported by dealers include manufacturers' stocks held by dealers at country shipping points.
[2] Dec. 1 estimate.
[3] Less than 100 tons.
[4] For crop year, June–May.
[5] Not including possible imports.

TABLE 276.—*Hay, tame: Acreage, yield, production, and December 1 price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Price per ton received by producers Dec. 1	
	Average, 1924–1928	1931	1932 [1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932 [1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Short tons*	*Short tons*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*
Maine	1,067	962	966	0.89	0.98	0.83	945	947	804	9.90	9.90
New Hampshire	378	344	336	1.03	1.10	.90	384	377	303	11.80	13.00
Vermont	918	907	916	1.18	1.34	1.21	1,108	1,213	1,104	9.50	9.80
Massachusetts	372	334	332	1.27	1.44	1.22	471	481	404	17.90	16.00
Rhode Island	37	34	34	1.20	1.29	1.21	46	44	41	19.40	17.70
Connecticut	287	250	249	1.21	1.29	1.24	356	323	309	17.00	16.60
New York	4,674	3,990	4,028	1.15	1.32	1.22	5,642	5,286	4,914	8.80	7.20
New Jersey	242	207	202	1.52	1.70	1.57	405	352	318	14.20	13.00
Pennsylvania	2,893	2,455	2,425	1.24	1.28	1.07	3,754	3,154	2,605	12.10	9.50
North Atlantic	10,870	9,483	9,488	1.16	1.28	1.14	13,112	12,177	10,802	10.67	9.10
Ohio	2,922	2,519	2,383	1.14	1.27	1.05	3,161	3,196	2,496	6.00	4.70
Indiana	1,874	1,775	1,774	1.14	1.15	1.25	2,182	2,041	2,212	6.80	5.00
Illinois	2,907	2,330	2,313	1.14	1.25	1.34	3,407	2,918	3,088	7.70	5.20
Michigan	2,721	2,394	2,365	1.12	1.06	1.31	3,043	2,543	3,105	8.60	5.50
Wisconsin	3,349	3,180	2,881	1.45	1.21	1.27	5,023	3,833	3,672	11.20	9.50
Minnesota	2,373	2,536	2,580	1.39	1.09	1.43	3,455	2,756	3,699	8.30	6.10
Iowa	3,118	2,863	2,777	1.40	1.14	1.61	4,045	3,266	4,468	8.40	5.80
Missouri	3,309	2,787	2,538	1.00	1.00	.90	3,219	2,784	2,285	6.80	5.60
North Dakota	1,007	1,771	1,366	1.27	.71	1.18	1,367	1,262	1,615	5.80	4.00
South Dakota	1,124	1,425	1,015	1.25	.53	1.03	1,259	759	1,045	8.00	4.25
Nebraska	1,615	1,661	1,649	1.74	1.26	1.77	2,707	2,093	2,926	7.20	4.50
Kansas	1,432	1,094	1,077	1.63	1.46	1.67	2,365	1,593	1,800	6.50	4.70
North Central	27,750	26,335	24,718	1.28	1.10	1.31	35,234	29,044	32,411	7.93	5.72
Delaware	69	63	73	1.37	1.68	1.56	100	106	114	11.00	9.30
Maryland	398	381	404	1.23	1.23	1.16	524	469	470	12.00	9.50
Virginia	950	910	844	1.02	1.10	.91	966	1,002	772	12.00	10.30
West Virginia	752	648	620	1.05	1.00	.90	835	651	558	12.40	10.10
North Carolina	616	721	745	.94	.94	.76	518	679	565	13.00	11.30
South Carolina	241	244	287	.75	.73	.73	159	178	210	11.90	10.00
Georgia	560	675	826	.62	.53	.58	292	360	481	10.00	8.00
Florida	82	78	84	.68	.59	.46	47	46	39	12.70	8.70
South Atlantic	3,667	3,720	3,883	.96	.94	.83	3,441	3,491	3,209	12.04	9.90
Kentucky	1,159	1,175	1,131	1.02	1.05	1.01	1,172	1,231	1,141	10.00	7.70
Tennessee	1,252	1,237	1,204	1.02	.95	.88	1,219	1,176	1,056	11.00	8.70
Alabama	477	572	637	.78	.78	.70	361	444	445	9.00	7.10
Mississippi	306	320	318	1.20	1.38	1.16	344	440	369	9.60	7.30
Arkansas	547	574	537	1.03	1.23	1.02	564	706	547	8.30	6.60
Louisiana	191	166	170	1.17	1.65	1.30	205	274	221	8.80	6.80
Oklahoma	454	445	510	1.60	1.28	1.46	661	568	746	6.70	5.00
Texas	513	543	558	1.08	1.12	1.15	557	606	642	7.80	5.40
South Central	4,899	5,032	5,065	1.08	1.08	1.02	5,084	5,445	5,167	9.23	6.99
Montana	1,235	1,636	1,654	1.63	1.01	1.46	2,106	1,648	2,418	9.00	5.50
Idaho	1,016	1,029	1,102	2.24	2.02	2.43	2,319	2,080	2,673	8.20	4.20
Wyoming	666	766	795	1.42	1.03	1.22	945	788	969	9.20	6.10
Colorado	1,280	1,258	1,274	1.86	1.31	1.44	2,264	1,647	1,830	7.60	6.50
New Mexico	163	162	167	1.95	2.24	1.93	325	363	322	11.00	7.50
Arizona	134	127	137	2.50	2.88	2.65	341	366	363	9.00	6.40
Utah	567	610	650	2.22	1.36	1.95	1,285	831	1,268	10.70	5.60
Nevada	211	177	200	2.06	1.26	2.00	407	223	401	9.80	4.80
Washington	846	845	848	1.96	2.06	2.02	1,702	1,738	1,717	8.60	7.20
Oregon	930	935	992	1.77	1.60	1.72	1,592	1,497	1,705	8.50	6.00
California	1,626	1,764	1,846	2.36	2.11	2.36	4,040	3,720	4,354	10.20	7.40
Western	8,674	9,309	9,665	1.98	1.60	1.86	17,326	14,901	18,020	9.10	6.15
United States	55,860	53,879	52,819	1.32	1.21	1.32	74,197	65,058	69,609	9.04	6.66

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 277.—*Hay, wild: Acreage, yield, production, and December 1 price, by States, averages, and annual 1931 and 1932*

State and division	Acreage harvested			Yield per acre			Production			Price per ton received by producers Dec. 1	
	Average, 1924–1928	1931	1932[1]	Average, 1919–1928	1931	1932	Average, 1924–1928	1931	1932[1]	1931	1932
	1,000 acres	*1,000 acres*	*1,000 acres*	*Short tons*	*Short tons*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*
Maine	9	5	5	0.93	1.00	0.90	9	5	4	7.00	7.40
New Hampshire	10	4	4	.90	.90	.80	9	4	3	7.00	8.90
Vermont	10	6	6	.96	.85	1.00	10	5	6	6.30	6.40
Massachusetts	10	6	6	.98	.97	.85	10	6	5	10.20	9.60
Rhode Island	2	1	1	.88	.80	.85	2	1	1	10.00	9.80
Connecticut	8	4	4	1.06	1.10	1.05	9	4	4	11.00	10.40
New York	58	38	40	.96	1.10	1.00	57	42	40	6.00	5.20
New Jersey	14	13	12	1.32	1.10	1.15	19	14	14	9.50	7.00
Pennsylvania	18	12	12	.96	1.05	.70	18	13	8	8.50	6.50
North Atlantic	140	89	90	1.00	1.06	.94	143	94	85	7.50	6.51
Ohio	5	5	4	1.15	.75	.70	5	4	3	5.50	4.10
Indiana	14	8	8	.93	.89	.95	13	7	8	4.80	3.75
Illinois	31	16	16	.88	.85	.90	27	14	14	6.80	4.00
Michigan	33	39	29	1.11	.95	.95	36	37	28	5.40	4.00
Wisconsin	204	315	381	1.24	1.00	1.05	258	315	400	6.50	5.80
Minnesota	1,958	1,776	1,865	1.07	.75	1.00	1,978	1,332	1,865	5.80	4.10
Iowa	270	174	174	1.08	.70	1.15	268	122	200	7.00	4.50
Missouri	142	135	138	1.15	1.00	1.00	157	135	138	4.80	4.40
North Dakota	1,660	1,619	1,862	.83	.60	.85	1,356	971	1,583	5.30	3.35
South Dakota	2,598	1,769	2,512	.68	.50	.65	1,625	884	1,633	6.90	3.15
Nebraska	3,008	2,728	2,919	.77	.55	.75	2,151	1,500	2,189	6.10	3.75
Kansas	931	892	892	.96	.85	1.00	875	758	892	4.30	3.20
North Central	10,853	9,476	10,800	.85	.64	.83	8,749	6,079	8,953	5.80	3.71
Delaware	2	2	3	1.15	1.50	1.00	2	3	3	6.00	3.50
Maryland	3	5	3	.95	.90	.90	3	4	3	9.00	6.60
Virginia	13	9	7	.80	.80	.65	10	7	5	9.00	7.00
West Virginia	10	6	5	1.05	.81	.90	11	5	4	9.90	7.50
North Carolina	36	24	19	1.10	1.10	.80	33	26	15	9.50	8.80
South Carolina	8	11	11	.81	.80	.60	4	9	7	11.50	7.80
Georgia	17	19	18	1.00	.90	.90	18	17	16	8.00	7.00
Florida	4	4	4	.84	.70	.70	3	3	3	11.40	7.40
South Atlantic	93	80	70	1.00	.92	.80	84	74	56	9.30	7.43
Kentucky	30	10	10	.92	.95	.95	30	10	10	6.50	5.80
Tennessee	48	38	40	.82	.80	.73	39	30	29	7.20	5.40
Alabama	30	42	42	.81	.80	.90	22	34	38	8.00	5.90
Mississippi	35	38	38	1.05	1.10	1.00	37	42	38	6.50	5.20
Arkansas	140	152	160	1.08	1.10	.90	151	167	144	5.50	4.50
Louisiana	15	26	26	1.18	1.15	.75	14	30	20	6.00	5.70
Oklahoma	493	511	531	1.02	.83	.85	483	424	451	5.00	3.50
Texas	173	205	205	.96	.85	.90	158	174	184	7.30	5.10
South Central	964	1,022	1,052	1.00	.89	.87	934	911	914	5.83	4.28
Montana	637	402	804	.88	.70	.85	609	281	683	8.00	5.00
Idaho	96	78	101	1.20	1.00	1.50	121	78	152	7.00	3.35
Wyoming	354	263	310	.93	.50	.75	335	132	232	9.40	5.40
Colorado	359	362	366	1.02	.80	.90	381	290	329	7.50	5.40
New Mexico	28	23	23	.86	.90	.75	25	21	17	8.00	6.50
Arizona	7	12	10	.76	1.10	1.00	4	13	10	8.70	5.70
Utah	71	66	70	1.12	1.05	1.05	82	69	74	8.70	4.40
Nevada	152	36	146	1.00	.80	1.20	151	29	175	9.60	4.00
Washington	29	31	31	1.30	1.15	1.30	39	36	40	7.80	6.00
Oregon	212	222	289	.86	.85	1.00	188	189	289	7.50	4.75
California	135	97	136	1.09	.85	1.25	154	82	170	8.00	5.30
Western	2,079	1,592	2,286	.97	.77	.95	2,090	1,220	2,171	7.97	4.91
United States	14,129	12,250	14,298	.88	.68	.85	12,000	8,378	12,179	6.17	4.00

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 278.—*Hay: Acreage, production, December 1 price, exports, etc., United States, 1919–1932*

Year	Tame hay: Acreage harvested	Tame hay: Average yield per acre	Tame hay: Production	Tame hay: Price per ton received by producers Dec. 1	Tame hay: Domestic exports year beginning July [1]	Tame hay: Imports year beginning July 1 [1]	Wild hay: Acreage harvested	Wild hay: Average yield per acre	Wild hay: Production	Wild hay: Price per ton received by producers Dec. 1
	1,000 acres	*Short tons*	*1,000 short tons*	*Dollars*	*1,000 short tons*	*1,000 short tons*	*1,000 acres*	*Short tons*	*1,000 short tons*	*Dollars*
1919	*55,653*	*1.34*	*74,724*				*17,186*	*0.91*	*15,631*	
1919	56,020	1.37	76,589	20.15	67	252	17,124	.93	15,891	10.52
1920	56,769	1.34	76,164	17.78	55	126	16,291	.95	15,633	11.38
1921	57,448	1.24	71,035	12.09	61	5	15,651	.88	13,811	6.57
1922	59,280	1.36	80,790	12.55	53	35	16,181	.90	14,561	7.30
1923	57,717	1.30	75,286	14.10	24	403	15,864	.90	14,312	8.16
1924	59,058	1.36	80,118	13.80	25	119	15,166	.83	12,601	7.92
1925	55,064	1.22	67,155	13.95	18	431	14,685	.79	11,643	8.55
1926	54,851	1.23	67,478	14.08	15	209	13,337	.68	9,068	10.04
1927	56,930	1.47	83,648	11.30	17	84	14,535	1.03	15,003	6.59
1928	53,395	1.36	72,586	12.22	14	40	12,924	.90	11,656	7.25
1929	*54,311*	*1.37*	*74,313*				*13,617*	*.81*	*10,968*	
1929	*55,017*	*1.38*	*76,110*	*12.19*	*9*	*60*	*13,586*	*.82*	*11,194*	*8.04*
1930	*52,623*	1.21	*63,566*	*12.62*	*6*	*121*	*13,793*	*.78*	*10,744*	*7.10*
1931	53,879	1.21	65,058	9.04	3	20	12,259	.68	8,378	6.17
1932 [2]	52,819	1.32	69,609	6.66			14,298	.85	12,179	4.00

Bureau of Agricultural Economics. *Italic figures are census returns; other acreage, production, and yield figures are estimates of the Crop Reporting Board.* Revised, 1919 to 1928. See introductory text. See *1927 Yearbook, p. 927, for data for earlier years.*

[1] Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1926; January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.
[2] Preliminary.

TABLE 279.—*Hay, tame, by kinds: Production, United States, 1919–1932*

Year	Alfalfa	Clover and timothy	Sweetclover	Lespedeza (Japan clover)	Grains cut green for hay	Annual legumes	Millet, Johnson grass, Sudan grass, and other	All tame	Sorgo for forage and hay [1]
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
1919	19,380	[2] 42,734			5,362	2,078	7,035	76,589	
1920	20,458	[2] 41,319			5,150	2,149	7,088	76,164	
1921	20,071	[2] 36,101			5,441	2,235	7,187	71,035	
1922	20,110	[2] 46,253			4,252	2,604	7,571	80,790	
1923	21,630	[2] 38,522			4,159	2,738	8,237	75,286	
1924	21,140	44,267	999	286	3,337	2,654	7,435	80,118	
1925	22,045	32,403	994	202	3,894	1,940	5,677	67,155	
1926	22,140	31,181	849	334	3,983	2,819	6,172	67,478	
1927	25,940	41,838	1,362	398	3,887	3,440	6,783	83,648	
1928	24,214	33,151	1,349	379	3,500	3,611	6,382	72,586	
1929	23,854	38,405	1,140	384	3,506	3,030	5,791	76,110	3,253
1930	22,949	27,593	851	224	4,145	2,677	5,127	63,566	2,698
1931	21,088	27,806	753	385	4,934	4,478	5,614	65,058	3,635
1932 [3]	25,992	26,033	936	343	5,162	4,753	6,390	69,609	3,948

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. Revised, 1919 to 1928. See introductory text.

[1] Not included in "All tame hay."
[2] Includes sweetclover and Lespedeza.
[3] Preliminary.

TABLE 280.—*Hay: Receipts at principal markets, 1924–25 to 1931–32*

Year beginning July	Boston	New York	Pittsburgh	Cincinnati	Chicago	Minneapolis	St. Louis	Kansas City	Omaha	San Francisco
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1924–25	46,188	126,636	55,752	95,760	127,740	59,724	81,240	303,924	62,520	53,448
1925–26	35,340	97,080	49,980	43,752	117,372	45,732	82,392	318,000	62,268	49,632
1926–27	36,504	71,160	65,172	46,056	106,756	59,100	68,172	270,756	75,936	46,572
1927–28	32,400	48,996	42,720	71,052	91,728	41,340	53,592	240,720	64,800	37,200
1928–29	26,964	37,236	29,916	79,152	95,016	36,300	53,244	247,296	76,488	45,060
1929–30	21,708	33,768	26,232	67,392	70,308	33,072	60,120	216,852	65,820	47,268
1930–31	16,356	40,452	26,160	69,012	55,416	35,532	51,876	160,872	71,556	52,224
1931–32	13,404	33,828	20,400	18,960	39,252	37,716	19,752	103,332	62,640	20,688

Bureau of Agricultural Economics. Compiled from weekly reports from the various markets to the grain, hay, and feed market news service of the Bureau of Agricultural Economics.

TABLE 281.—*Hay, loose: Estimated average price per ton received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average
	ALL												
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	11.78	11.98	12.25	12.44	12.75	13.15	13.59	13.60	13.63	13.73	13.65	13.75	12.93
1924–25	13.49	12.95	12.68	12.64	12.88	12.69	12.70	12.83	12.39	12.48	12.17	11.82	12.76
1925–26	12.48	12.25	12.42	12.47	13.07	13.40	13.31	13.03	12.97	12.78	13.12	12.98	12.83
1926–27	12.96	13.04	12.88	13.08	13.22	13.47	13.38	13.64	13.48	13.26	13.20	13.10	13.23
1927–28	11.71	9.97	10.51	10.63	10.54	10.55	10.60	10.24	10.19	10.29	10.70	11.01	10.57
1928–29	10.86	10.39	10.59	10.60	10.89	11.23	11.61	12.06	12.37	12.30	12.15	11.88	11.29
1929–30	11.17	10.85	11.05	11.07	11.18	11.04	11.16	11.19	10.95	10.97	10.98	10.91	11.05
1930–31	10.47	11.31	12.14	12.17	12.19	11.33	11.21	10.92	10.66	10.59	10.54	9.97	11.37
1931–32	9.30	9.05	8.88	8.57	8.68	8.71	8.60	8.45	8.69	8.74	8.48	7.60	8.71
1932–33	6.95	6.82	6.80	6.54	6.49	6.14	------	------	------	------	------	------	--------
	ALFALFA												
1923–24	12.45	12.01	12.78	13.37	13.59	14.39	13.99	14.08	13.98	14.09	14.12	13.70	13.46
1924–25	13.19	13.84	13.59	12.85	13.91	13.40	14.50	14.78	14.44	14.08	14.34	12.83	13.66
1925–26	13.02	13.00	12.91	13.41	13.74	14.14	13.90	14.24	13.50	13.53	13.17	13.33	13.49
1926–27	12.94	13.15	13.13	13.29	13.79	13.57	13.83	14.21	14.38	13.85	13.59	13.03	13.56
1927–28	11.73	11.47	11.34	11.52	11.75	12.02	12.09	11.84	12.46	12.56	12.90	12.42	11.95
1928–29	11.98	11.82	12.20	12.82	13.29	13.90	14.54	15.34	16.07	16.20	15.50	14.50	13.74
1929–30	13.12	13.17	13.50	13.84	14.00	14.41	14.66	14.45	13.90	13.42	12.87	12.14	13.68
1930–31	11.44	12.16	12.85	12.97	12.94	12.52	12.21	11.74	11.29	11.01	10.87	10.24	12.15
1931–32	9.80	9.86	9.67	9.58	9.94	10.31	10.14	10.25	10.84	10.79	9.97	8.63	10.03
1932–33	7.38	7.15	7.27	7.05	7.01	6.77	------	------	------	------	------	------	--------
	CLOVER												
1923–24	13.52	13.51	14.12	14.73	14.94	15.82	15.51	15.93	16.31	16.08	15.92	15.95	15.06
1924–25	15.45	14.00	13.75	13.65	13.64	13.45	13.25	13.30	12.52	12.41	12.67	12.26	13.68
1925–26	13.03	13.67	14.06	14.09	14.74	15.28	14.79	14.82	14.79	14.88	15.13	15.07	14.47
1926–27	14.40	14.25	14.60	14.71	14.76	15.24	15.71	16.16	15.64	15.51	15.21	14.65	15.05
1927–28	13.11	12.16	11.78	11.91	11.86	11.91	12.24	11.96	12.02	12.23	12.51	12.63	12.18
1928–29	12.52	12.25	12.50	12.58	13.01	13.05	13.41	13.59	13.93	13.43	13.24	12.92	12.96
1929–30	11.60	11.61	11.82	11.77	11.82	11.97	12.24	12.24	12.31	12.27	12.19	12.25	11.97
1930–31	11.71	13.20	14.62	14.62	14.62	13.52	13.53	12.78	12.45	12.57	12.21	11.28	13.45
1931–32	10.30	10.15	9.81	9.65	9.65	9.70	9.72	9.14	9.46	9.49	9.06	8.38	9.62
1932–33	8.04	8.03	7.97	7.58	7.53	7.62	------	------	------	------	------	------	--------
	TIMOTHY												
1923–24	14.86	14.68	15.13	16.22	16.78	16.95	16.96	17.25	17.53	17.53	17.48	17.52	16.42
1924–25	16.74	15.24	14.47	14.54	14.00	14.37	14.29	14.24	13.31	13.39	13.38	13.05	14.62
1925–26	13.89	14.06	14.98	15.11	15.38	15.87	15.82	15.79	15.59	15.81	16.31	16.64	15.34
1926–27	16.01	15.52	15.32	15.49	15.62	15.81	14.58	15.82	15.39	15.05	15.14	14.97	15.41
1927–28	13.29	12.03	11.70	11.58	11.67	11.31	11.34	11.03	11.14	11.17	11.75	11.82	11.69
1928–29	11.68	11.70	11.77	11.86	12.18	12.35	12.45	12.99	13.01	12.86	12.64	12.57	12.28
1929–30	11.91	11.61	11.60	11.67	11.70	11.57	11.55	11.55	11.57	11.79	12.04	12.29	11.71
1930–31	12.32	13.53	14.76	14.82	14.87	14.58	14.50	14.36	14.16	14.09	13.76	12.84	14.20
1931–32	10.77	10.07	9.79	9.56	9.34	9.14	8.86	8.26	8.36	8.14	8.23	7.73	9.13
1932–33	7.34	7.34	7.20	7.19	7.04	7.15	------	------	------	------	------	------	--------
	PRAIRIE												
1923–24	9.17	8.97	8.58	9.19	9.07	9.26	8.84	8.87	8.66	8.78	8.74	8.54	8.91
1924–25	8.35	8.60	8.49	8.25	8.25	8.62	9.14	9.08	9.05	9.11	9.27	8.55	8.61
1925–26	8.93	8.55	9.24	9.41	9.39	9.78	9.73	9.53	9.48	9.08	9.54	9.59	9.33
1926–27	9.63	10.55	10.52	10.78	10.76	10.98	11.28	11.76	11.50	10.70	11.51	10.77	10.89
1927–28	9.15	8.65	7.98	7.67	7.47	7.55	7.41	6.98	6.79	6.96	7.32	7.59	7.70
1928–29	7.80	7.34	7.62	7.71	7.72	7.88	8.01	8.33	8.99	8.81	8.76	8.77	8.06
1929–30	8.21	7.96	8.13	7.97	8.11	8.18	8.30	8.41	8.11	8.12	7.96	7.78	8.12
1930–31	7.12	7.63	7.89	7.68	7.48	7.21	7.23	6.82	6.51	6.44	6.30	6.34	7.28
1931–32	6.52	6.64	6.68	6.53	6.67	6.56	6.48	6.70	7.30	7.47	7.15	6.02	6.74
1932–33	5.14	4.71	4.57	4.45	4.36	4.06	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by monthly marketings. Mean of prices of all loose hay reported on 1st of month and 1st of succeeding month, July, 1922–December, 1923. For previous data on alfalfa, clover, timothy, and prairie hay see 1930 or earlier Yearbooks.

TABLE 282.—*Hay, baled: Average price per ton in car lots at leading markets, by kind and grade, 1922–23 to 1931–32*

Year beginning July	Alfalfa, Kansas City		Clover, Cincinnati			Prairie upland, Kansas City		Timothy, Chicago	
	No. 1	No. 2	No. 1	No. 1, light mixed	No. 1, mixed	No. 1	No. 2	No. 1	No. 2
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1922–23	22.10	16.80	16.40	17.40	18.40	14.40	12.90	22.30	18.50
1923–24	23.60	16.90	23.90	23.40	22.60	13.90	12.60	26.30	23.30
1924–25	20.10	15.00	17.90	18.00	17.20	11.20	9.80	23.90	19.50
1925–26	21.10	17.40	22.50	23.60	22.60	14.20	12.80	24.70	21.90
1926–27	19.00	16.60	22.90	21.20	21.70	14.50	12.70	21.80	19.70
1927–28	20.80	16.00	-------	15.70	16.40	10.90	8.90	18.60	16.40
1928–29	24.80	22.70	24.10	19.20	20.00	12.10	10.50	22.20	20.20
1929–30	22.10	17.90	17.20	18.00	17.60	11.70	10.30	19.00	16.70
1930–31	19.90	15.90	23.60	21.70	22.50	12.10	10.50	20.10	18.50
1931–32	13.62	10.71	12.21	12.81	13.25	9.48	8.31	14.79	13.19

Bureau of Agricultural Economics. Compiled from reports made direct to the bureau.

TABLE 283.—*Alfalfa meal, No. 1 medium: Average price per ton, bagged, in car lots, Kansas City, 1923–24 to 1932–33*

Crop year	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	21.50	22.40	25.50	25.70	26.90	25.20	26.25	23.90	23.20	20.90	21.20	21.75	23.70
1924–25	22.00	22.60	23.25	23.10	22.50	23.90	24.20	22.50	22.25	22.00	22.70	22.90	22.80
1925–26	23.00	24.00	24.25	24.40	24.10	24.40	24.80	24.00	23.10	23.90	25.40	23.90	24.10
1926–27	23.00	22.80	22.25	22.40	22.90	22.30	22.00	21.75	21.40	21.00	22.20	21.60	22.10
1927–28	21.75	22.40	23.40	23.10	22.75	23.30	24.40	26.25	29.40	33.50	34.25	31.70	26.40
1928–29	27.60	25.60	26.00	26.60	26.60	28.60	29.75	29.90	28.50	28.00	27.00	25.10	27.40
1929–30	23.50	25.00	27.30	27.50	26.80	27.40	27.40	25.50	23.60	25.00	23.80	22.00	25.40
1930–31	22.70	24.70	26.60	25.60	25.00	24.20	23.60	21.25	20.40	21.00	19.60	18.10	22.70
1931–32	17.90	16.80	17.60	17.20	19.00	18.60	18.90	17.60	17.00	17.00	17.00	15.40	17.60
1932–33	15.50	15.90	16.00	15.60	15.40	15.25	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

TABLE 284.—*Pasture: Condition, 1st of month, United States, 1909–1932*

Year	May	June	July	Aug.	Sept.	Oct.	Year	May	June	July	Aug.	Sept.	Oct.
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1909	79.1	86.9	91.8	86.4	------	------	1921	90.0	89.4	84.4	78.3	82.1	84.8
1910	86.9	87.1	79.7	71.5	------	------	1922	85.9	94.6	88.5	86.7	78.7	72.7
1911	83.1	82.7	67.2	62.7	------	------	1923	79.4	86.1	87.2	79.4	80.2	85.0
1912	82.9	92.5	89.7	87.3	------	------	1924	82.4	83.2	87.2	82.0	76.6	78.6
1913	85.5	88.1	81.6	74.3	------	------	1925	82.2	75.7	73.0	69.5	67.4	72.9
1914	88.9	90.0	83.0	76.2	------	------	1926	74.6	77.0	77.0	69.9	78.2	83.7
1915	88.4	92.5	93.2	95.5	97.7	95.9	1927	87.0	88.3	92.8	86.9	84.2	80.1
1916	84.8	90.8	94.8	84.5	79.8	76.9	1928	71.3	78.6	84.4	85.6	83.3	77.7
1917	79.9	83.1	84.1	78.5	77.5	75.5	1929	86.9	87.2	87.5	79.7	67.1	70.2
1918	81.6	89.3	82.0	72.4	67.7	73.5	1930	77.3	80.4	74.6	56.4	47.7	56.1
1919	91.1	97.4	95.8	85.3	81.6	78.9	1931	78.8	78.5	73.0	63.7	63.0	63.5
1920	79.3	90.2	91.4	87.7	88.1	86.9	1932	74.1	77.6	79.0	71.1	67.6	67.1

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

TABLE 285.—*Pasture:*[1] *Condition, 1st of month, by States, average 1920–1929 and 1932*

State and division	May		June		July		August		September		October	
	Average, 1920–1929	1932	Average, 1920–1929	1932	Average, 1920–1929	1932	Average, 1920–1929	1932	Average, 1920–1929	1932	Average, 1920–1929	1932
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Maine	86	85	88	76	87	68	86	75	82	77	79	80
New Hampshire	86	84	89	71	87	63	89	70	85	66	82	63
Vermont	86	84	88	73	91	82	93	85	89	82	87	73
Massachusetts	84	83	89	69	87	67	83	60	83	66	81	71
Rhode Island	84	79	89	80	88	84	84	68	82	72	80	73
Connecticut	82	83	88	76	87	77	82	64	82	71	82	76
New York	81	76	84	78	85	76	82	75	80	69	80	60
New Jersey	82	79	85	74	79	67	76	52	83	45	80	45
Pennsylvania	81	77	85	79	84	70	81	65	81	50	80	39
North Atlantic	81.8	78.0	85.5	77.2	85.0	73.0	82.5	69.9	81.6	62.6	80.2	55.2
Ohio	79	76	85	72	84	65	83	71	84	50	82	52
Indiana	79	75	85	76	85	73	78	67	81	64	81	76
Illinois	82	72	84	71	84	75	77	66	79	73	80	72
Michigan	72	65	84	87	83	81	75	71	72	62	78	70
Wisconsin	78	66	84	78	85	72	79	57	74	51	79	51
Minnesota	78	70	81	88	83	82	76	62	70	54	75	60
Iowa	84	78	83	86	86	90	81	80	84	88	88	88
Missouri	84	72	86	55	88	69	81	65	82	71	83	64
North Dakota	75	62	79	79	84	87	79	66	71	49	72	49
South Dakota	78	77	79	89	82	94	78	70	73	65	74	67
Nebraska	84	70	87	81	88	89	82	70	78	72	79	70
Kansas	83	80	86	75	87	87	83	68	78	61	82	66
North Central	80.9	74.1	84.1	77.2	85.3	80.2	70.9	68.9	78.5	60.2	80.7	67.7
Delaware	82	78	84	88	74	80	74	74	78	55	74	49
Maryland	79	75	82	82	77	78	74	66	79	52	77	45
Virginia	80	75	83	83	80	80	80	64	84	43	79	39
West Virginia	81	73	85	70	87	67	87	78	88	66	84	47
North Carolina	84	75	83	80	85	82	83	61	83	64	79	58
South Carolina	81	65	78	67	79	74	79	52	75	66	71	59
Georgia	82	69	82	73	82	80	83	76	77	77	72	71
Florida	80	62	81	66	87	81	90	71	90	84	86	81
South Atlantic	81.0	72.4	82.9	76.4	82.4	77.0	82.3	68.3	82.4	60.6	78.4	52.4
Kentucky	83	79	86	74	88	76	83	73	83	72	82	73
Tennessee	83	75	86	75	85	71	80	69	81	69	78	67
Alabama	83	70	84	78	82	81	80	79	76	79	70	74
Mississippi	84	70	85	73	85	71	80	74	78	73	73	74
Arkansas	83	78	87	66	85	68	80	76	74	57	74	53
Louisiana	84	69	86	75	87	70	82	74	79	71	77	61
Oklahoma	83	71	87	62	87	79	80	71	72	65	75	61
Texas	84	69	87	77	86	75	78	74	70	69	74	80
South Central	83.5	71.4	86.5	73.5	86.0	75.0	79.3	73.3	74.1	69.1	75.2	72.7
Montana	80	76	88	89	91	96	84	81	80	78	79	77
Idaho	86	78	92	92	89	95	84	86	81	80	80	76
Wyoming	87	78	96	94	98	92	93	75	91	70	90	62
Colorado	85	68	89	77	89	74	84	63	86	60	82	57
New Mexico	73	71	82	80	78	76	75	72	81	85	79	72
Arizona	84	90	82	88	79	88	80	85	85	81	84	80
Utah	86	76	92	84	87	84	84	84	83	78	82	77
Nevada	85	78	90	94	88	93	86	90	84	91	84	88
Washington	84	84	88	88	85	84	74	80	70	76	74	69
Oregon	90	86	93	91	90	90	84	84	78	81	78	75
California	85	76	83	81	81	80	79	79	78	77	76	76
Western	83.5	76.4	87.1	85.0	86.4	84.7	82.2	77.7	81.0	76.3	79.8	72.5
United States	81.9	74.1	85.0	77.6	85.3	79.0	80.6	71.1	78.6	67.6	79.3	67.1

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] For range States, conditions given as reported. Probably relates largely to farm pasture; i. e., range not included.

TABLE 286.—*Hops: Acreage, production, December 1 price, imports, exports, and consumption, United States, 1922–23 to 1932–33*

Year beginning July	Acreage harvested	Average yield per acre	Production	Price per pound received by producers Dec. 1	Imports[1]	Domestic exports[1]	Net exports[1]	Consumption by brewers[2]
	Acres	*Pounds*	*1,000 pounds*	*Cents*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1922–23	23,400	1,186	27,744	8.6	1,206	13,497	12,401	4,556
1923–24	18,440	1,071	19,751	18.8	761	20,461	19,832	3,815
1924–25	20,350	1,360	27,670	10.3	439	16,122	15,737	[3] 3,256
1925–26	20,350	1,404	28,573	21.8	581	14,998	14,592	[3] 3,426
1926–27	20,800	1,516	31,522	23.1	470	13,369	12,936	[3] 3,149
1927–28	24,600	1,246	30,658	22.9	753	11,812	11,087	[3] 3,071
1928–29	26,200	1,257	32,944	19.3	649	8,836	8,198	2,735
1929–30	24,400	1,360	33,195	11.4	926	6,793	5,901	2,627
1930–31	19,500	1,202	23,447	14.8	1,026	5,693	4,583	2,197
1931–32	21,400	1,234	26,410	13.8	1,253	3,817	2,504	1,841
1932–33[4]	22,000	1,096	24,120	[5] 17.5				

Bureau of Agricultural Economics. Compiled from reports of the Division of Crop and Livestock Estimates, Bureau of Foreign and Domestic Commerce, records of the Bureau of Internal Revenue, 1922–23 to 1925–26; annual reports of the Commissioner of Prohibition, 1926–27 to 1929–30; and Commissioner of Industrial Alcohol, 1930–31.

[1] *Compiled from Monthly Summary of Foreign Commerce of the United States*, June issues, 1922–1926; January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.
[2] *Figures represent hops used to make cereal beverages.*
[3] Not including 57,936 pounds in 1924, 71,508 pounds in 1925, 960 pounds in 1926, and 6,294 pounds in 1927 used *in the manufacture of distilled spirits.*
[4] Preliminary.
[5] Weighted average price, crop-marketing season.

TABLE 287.—*Hops: Acreage, yield per acre, and production in specified countries, 1930–31 to 1932–33*

Country	Acreage			Yield per acre			Production		
	1930–31	1931–32	1932–33[1]	1930–31	1931–32	1932–33[1]	1930–31	1931–32	1932–33[1]
	Acres	*Acres*	*Acres*	*Pounds*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
North America:									
Canada[2]	948	925		1,230	1,330		1,166	1,230	
United States[3]	19,500	21,400	22,000	1,202	1,234	1,096	23,447	26,410	24,120
Europe:									
England and Wales	[4] 19,997	[4] 19,528	[4] 16,531	[5] 1,718	[5] 1,056	[5] 1,289	28,336	18,928	21,056
Belgium	2,545	2,051	1,000	1,163	560	884	2,961	1,148	884
France	7,517	5,893	4,574	810	200	461	6,088	1,178	2,110
Germany	32,306	25,325	19,800	754	677	552	24,366	17,152	10,928
Austria	170	126		365	349		62	44	
Czechoslovakia	38,449	30,194	23,872	844	900	689	32,464	27,177	16,451
Hungary	574	566	442	537	484		308	274	
Yugoslavia	7,139	[6] 5,683	[6] 3,903	543	615	593	3,873	[6] 3,494	[6] 2,315
Rumania	175	210		377	505		66	106	
Poland	[6] 5,671	[6] 6,250	[6] 5,500	583	627	529	[6] 3,307	[6] 3,920	[6] 2,912
Total European countries reporting acreage and production, all years	113,624	94,924	75,180	892	769	754	101,395	72,997	56,656
Oceania:									
Australia	1,168			1,689			1,973		
New Zealand	634						[6] 600		
Total countries reporting acreage and production, all years	133,124	116,324	97,180	938	855	831	124,842	99,407	80,776
Estimated world total, excluding Russia[7]	136,793	120,000	100,000				129,017	104,000	85,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Acreage and production figures are for the harvesting season 1930 to 1932, in the Northern Hemisphere and 1930–31 to 1932–33 in the Southern Hemisphere.

[1] Preliminary.
[2] *British Columbia.*
[3] Principal producing States.
[4] *These figures include the acreage left unpicked*, which was estimated at 3,500 acres in 1930, 1,600 acres in 1931, and 200 acres in 1932.
[5] *Yield based on acreage picked.*
[6] Unofficial estimate.
[7] *Exclusive of acreage and production in minor producing countries for* which no data are available.

TABLE 288.—*Hops: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year: Average, 1925–1929, Exports	Average, 1925–1929, Imports	1928, Exports	1928, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931[1], Exports	1931[1], Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Czechoslovakia	15,936	1,228	14,452	1,644	18,711	374	10,890	11	23,272	0
United States	12,654	612	7,985	581	7,677	765	7,640	1,090	3,797	1,077
Yugoslavia	9,427	231	16,929	198	7,269	218	5,966	167	3,476	185
France	5,601	4,458	3,612	4,338	3,437	4,601	2,670	4,516	8,409	352
Poland	3,552	447	4,699	366	5,708	636	4,569	475	2,573	148
New Zealand	387	6	408	1	266	1	204	1	90	0
Russia[2]	*346*	*126*	*1,569*	*0*	*161*	*0*	9	7	13	*0*
Australia[2]	269	208	618	157	131	121	15,164	12,370	-------	-------
Total	48,172	7,316	50,272	7,285	43,360	6,716	56,112	18,652	41,630	1,762
PRINCIPAL IMPORTING COUNTRIES										
Germany	2,964	11,406	3,092	9,967	5,080	8,011	5,721	6,190	9,743	3,879
United Kingdom	4,672	7,855	1,977	7,412	1,478	6,967	2,498	4,950	2,507	5,636
Irish Free State	0	5,997	0	5,852	0	5,624	0	5,793	0	6,392
Belgium	2,173	5,300	1,433	6,321	449	6,730	370	7,207	266	8,701
Austria	117	3,082	201	3,088	68	3,382	37	3,074	20	2,533
Canada	*387*	*2,574*	*468*	*2,397*	*296*	*2,823*	*216*	*3,366*	*125*	*889*
Netherlands	89	1,273	50	1,246	28	1,672	24	1,479	27	1,237
Brazil	0	1,101	0	1,201	0	1,238	0	913	0	706
Switzerland	0	1,097	0	1,189	0	1,418	0	1,263	0	1,234
Sweden	1	1,081	0	1,057	0	1,114	1	1,281	0	1,170
Argentina	0	1,051	0	1,241	0	831	0	1,224	0	653
Japan	0	908	0	1,002	0	823	0	1,158	0	696
Denmark	*1*	*814*	*0*	*896*	1	877	1	*1,212*	*2*	*1,155*
Italy	8	672	10	743	1	442	5	586	8	315
Union of South Africa	0	530	0	496	0	402	0	513	0	305
Norway	0	334	0	199	0	360	0	261	0	297
Hungary	121	310	188	278	69	198	85	135	39	0
British India	0	166	0	129	0	172	0	114	0	107
Total	*10,533*	*45,553*	*7,439*	*44,774*	*7,470*	*43,084*	*8,958*	*40,739*	*12,737*	*35,905*

Bureau of Agricultural Economics. Official sources except where otherwise noted. Lupulin and hop*fenmehl (hop meal) are not included when given separately.*

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.

TABLE 289.—*Peanuts: Acreage, yield per acre, production, and December 1 price, United States, 1919–1932*

Year	Peanuts gathered: Area	Peanuts gathered: Yield per acre	Peanuts gathered: Total quantity gathered	Peanuts gathered: Farm price, Dec. 1[1]	Peanuts, all: Total acreage[2]	Peanuts, all: Yield per acre	Peanuts, all: Total production[3]
	1,000 acres	*Pounds*	*1,000 lbs.*	*Cents*	*1,000 acres*	*Pounds*	*1,000 lbs.*
1919	1,132	691.9	783,273	9.33	-------	-------	-------
1920	*1,181*	712.5	*841,474*	*5.26*	-------	-------	-------
1921	1,214	683.1	829,307	3.99	-------	-------	-------
1922	1,005	630.0	633,114	4.68	-------	-------	-------
1923	896	722.9	647,762	6.78	-------	-------	-------
1924	1,187	627.7	745,059	4.60	1,830	615.3	1,125,932
1925	958	729.1	698,475	3.64	1,563	666.4	1,041,514
1926	843	749.5	631,825	[4] 4.54	1,315	669.1	879,923
1927	1,142	757.0	864,549	[4] 3.98	1,786	735.0	1,312,643
1928	1,211	706.1	855,096	[4] 4.44	1,930	661.2	1,276,078
1929	1,360	703.3	956,448	[4] 3.83	2,001	670.4	1,341,416
1930	1,133	659.4	747,085	[4] 3.54	1,862	632.0	1,176,700
1931	*1,419*	*763.3*	*1,083,110*	[4] *2.09*	*2,145*	*717.4*	*1,538,790*
1932[5]	1,603	625.1	1,002,060	[4] 1.43	2,421	579.5	1,403,050

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. See 1930 Yearbook, p. 813, for data for earlier years.

[1] Farm prices are as of Nov. 15, 1919–1923; Dec. 1, 1924–1928; weighted average price or crop marketing season, 1929–1932.
[2] Peanuts planted in corn are included, reduced to their equivalent solid acres.
[3] Including peanuts grazed or hogged off as well as those gathered.
[4] Average of State prices weighted by total production.
[5] Preliminary.

TABLE 290.—*Peanuts:*[1] *Acreage, yield, production, and value, by States, 1931 and 1932*

State	Nuts gathered					
	Acres		Yield per acre		Production	
	1931	1932[1]	1931	1932	1931	1932[1]
	1,000 acres	*1,000 acres*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*
Virginia	152	140	1,080	1,000	164,160	140,000
North Carolina	266	271	1,150	940	305,900	254,740
South Carolina	14	16	650	640	9,100	10,240
Georgia	410	484	660	475	270,600	229,900
Florida	55	63	580	415	31,900	26,145
Tennessee	9	14	700	750	6,300	10,500
Alabama	273	328	600	520	163,800	170,560
Mississippi	20	29	650	660	13,000	19,140
Arkansas	19	26	560	525	10,640	13,650
Louisiana	13	15	600	425	7,800	6,375
Oklahoma	27	37	540	590	14,580	21,830
Texas	161	180	530	550	85,330	99,000
United States	1,419	1,603	763.3	625.1	1,083,110	1,002,080

State	Total for all purposes				Weighted average price per pound, crop-marketing season		Value of total production, basis weighted average price for crop marketing season[4]	
	Acreage[3]		Production[3]					
	1931	1932[2]	1931	1932[2]	1931	1932	1931	1932
	1,000 acres	*1,000 acres*	*1,000 pounds*	*1,000 pounds*	*Cents*	*Cents*	*1,000 dollars*	*1,000 dollars*
Virginia	153	141	165,240	141,000	1.6	1.2	2,644	1,692
North Carolina	281	294	323,150	276,360	1.7	1.3	5,494	3,593
South Carolina	20	23	13,000	14,720	3.4	2.7	442	397
Georgia	723	838	477,180	398,050	2.1	1.4	10,021	5,573
Florida	271	273	157,180	113,295	2.4	1.5	3,772	1,699
Tennessee	9	14	6,300	10,500	2.9	1.5	183	159
Alabama	382	466	229,200	242,320	1.9	1.2	4,355	2,908
Mississippi	25	36	16,250	23,760	4.0	3.2	650	760
Arkansas	27	37	15,120	19,425	3.6	3.1	544	602
Louisiana	17	22	10,200	9,350	4.3	3.8	439	355
Oklahoma	36	48	19,440	28,320	3.0	1.5	583	425
Texas	201	229	106,530	125,950	2.9	1.5	3,089	1,889
United States	2,145	2,421	1,538,790	1,403,050	2.09	1.43	32,216	20,061

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Peanuts planted in corn are included, reduced to their equivalent solid acres.
[2] Preliminary.
[3] Including peanuts grazed or hogged off as well as those gathered.
[4] Total production for all purposes multiplied by price to give total value.

TABLE 291.—*Peanuts: Estimated average price per pound, in the shell, received by producers, United States, 1923–24 to 1932–33*

Crop year	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	6.7	7.0	6.8	6.2	6.4	6.7	6.8	6.7	6.4	6.5	6.4	6.6	6.6
1924–25	6.4	6.4	6.3	5.6	5.4	5.5	5.9	5.7	6.2	6.2	5.4	5.2	5.9
1925–26	5.7	4.7	5.1	4.4	4.5	4.7	4.8	5.1	5.0	4.7	5.3	5.3	4.7
1926–27	5.1	4.9	4.6	4.7	4.9	5.4	5.6	5.7	5.9	6.6	6.4	6.4	5.1
1927–28	6.0	4.9	4.6	5.2	5.4	5.4	5.4	5.5	5.7	5.6	5.5	5.5	5.2
1928–29	5.0	4.6	4.8	5.1	5.0	5.1	5.1	5.2	5.0	5.1	4.9	4.7	5.0
1929–30	4.6	4.4	4.0	3.8	3.7	3.5	3.5	3.5	3.7	3.6	3.7	3.8	3.6
1930–31	3.9	4.2	3.8	3.2	3.2	3.6	3.7	3.9	4.1	3.9	3.8	3.6	3.6
1931–32	3.1	2.3	2.2	2.0	2.0	1.9	2.0	1.9	1.7	1.6	1.4	1.7	2.0
1932–33	2.0	1.6	1.6	1.2									

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production to obtain a price for the United States; yearly price obtained by weighting monthly prices by estimated monthly marketings. For previous data see 1930 or earlier year books.

TABLE 292.—*Peanuts: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
British India	1, 320, 173	0	1, 828, 689	0	1, 322, 041	0	1, 590, 516	0
Senegal	951, 057	66	[2] 896, 867	[2] 131	[2] 1, 120, 411	[2] 4		
China	408, 762	42, 314	272, 645	55, 718	682, 081	16, 966	708, 880	930
Nigeria	266, 702	0	[2] 330, 079	0	[2] 327, 868	0		
French Possessions in India	[3] 251, 847	0		0		0		
Gambia	134, 328	0	126, 235	0	167, 465	0		
Dutch East Indies	61, 251	735	60, 153	818	45, 242	749	39, 008	667
Mozambique	54, 487	21	50, 838	68	54, 897	81	58, 278	262
Tanganyika	25, 728	0	17, 394	0	38, 826	0	6, 877	0
Anglo-Egyptian Sudan	12, 732	0	8, 258	0	10, 650	0		
French Guiana	10. 722	2	[2] 11, 232	0	[2] 4, 824	0		
Spain	3, 252	0	[2] 2, 349	0	[2] 2, 834	0		
Brazil	439	0	238	0	36	0	171	0
Total	3, 501, 480	43, 138	3 604, 977	56, 735	3, 677, 184	17, 802	2, 403, 730	1, 859
PRINCIPAL IMPORTING COUNTRIES								
France	12, 863	1, 619, 507	11, 707	1, 891, 117	5, 088	1, 957, 755	5, 300	1, 927, 161
Germany	0	1, 311, 186	0	2, 050, 751	0	2, 023, 087	0	1, 839, 597
United Kingdom	0	286, 186	0	388, 223	0	346, 993	0	426, 738
Italy	99	252, 338	72	376, 983	111	135, 327	41	269, 198
Netherlands	3, 278	203, 972	3, 046	203, 543	2, 890	241, 825	2, 937	286, 930
United States	4, 569	78, 563	4, 880	44, 555	2, 960	10, 902	1, 842	13, 620
Belgium	244	61, 350	187	69, 366	140	52, 435	547	59, 973
Denmark	0	40, 102	0	61, 719	0	69, 429	0	92, 857
British Malaya	12, 361	30, 390	9, 872	28, 607	3, 573	21, 387	2, 238	17, 434
Canada	0	29, 783	0	34, 961	0	29, 876	0	30, 141
Japan	885	26, 603	140	33, 130	150	36, 471	150	55, 761
Sweden	0	16, 095	0	14, 459	0	14, 940	0	17, 830
Algeria	313	10, 025	178	13, 745	135	[2] 10, 954	129	
Egypt	2, 599	6, 894	1, 266	4, 310	1, 648	7, 446	1, 146	5, 068
Tunis	0	4, 769	0	5, 814	0	4, 743	0	6, 092
Union of South Africa	401	4, 524	461	5, 629	904	3, 334	337	10, 371
Argentina	112	4, 029	82	9, 817	22	6, 982	55	13, 910
Australia [2]	0	[3] 3, 442	0	2, 329	0	505		
Philippine Islands	0	3, 951	0	3, 600	1, 148	3, 661	665	5, 364
Poland	1	1, 847	0	1, 307	0	950	0	947
Yugoslavia	0	1, 578	0	5, 448	0	3, 570	0	196
Total	37, 725	3, 996, 234	31, 891	5, 249, 413	18, 769	4, 982, 572	15, 387	5, 079, 188

Bureau of Agricultural Economics. Official sources except where otherwise noted. Includes shelled and unshelled, *assuming the peanuts to be unshelled unless otherwise stated. When shelled nuts were reported* they have been reduced to terms of unshelled at the ratio of 3 pounds unshelled to 2 pounds of shelled.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] 4-year average.

TABLE 293.—*Peanut oil, crude and virgin: Peanuts crushed, and quantity of oil produced in United States, 1922–23 to 1931–32*

Year beginning October	Peanuts crushed [1]					Oil produced				
	October–December	January–March	April–June	July–September	Total	October–December	January–March	April–June	July–September	Total
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1922–23	13, 169	9, 081	8, 436	941	31, 627	3, 256	1, 700	1, 998	255	7, 209
1923–24	6, 164	4, 676	5, 471	1, 928	16, 239	1, 406	1, 122	1, 328	438	4, 294
1924–25	17, 668	24, 678	16, 893	9, 096	68, 335	3, 804	5, 265	4, 091	1, 974	15, 134
1925–26	17, 134	17, 880	10, 668	4, 389	50, 071	3, 827	4, 001	3, 093	1, 006	11, 927
1926–27	10, 576	11, 143	6, 321	6, 966	35, 006	2, 544	2, 446	1, 400	1, 600	7, 990
1927–28	21, 810	24, 168	8, 177	6, 661	60, 816	5, 144	5, 324	1, 920	1, 626	14, 014
1928–29	14, 740	19, 596	10, 392	11, 320	56, 048	3, 569	4, 463	2, 331	2, 614	12, 977
1929–30	31, 598	50, 888	25, 606	12, 672	120, 764	6, 723	11, 192	6, 413	2, 751	27, 079
1930–31	22, 744	23, 940	17, 950	4, 996	69, 630	5, 139	5, 214	4, 061	1, 134	15, 548
1931–32 [2]	15, 376	14, 874	12, 750	8, 464	51, 464	3, 320	3, 415	2, 990	1, 843	11, 568

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census on Animal and vegetable fats and oils.

[1] Quantities reported in terms of hulled have been converted to in-the-hull basis by multiplying by 1.5
[2] Preliminary.

TABLE 294.—*Peanut oil: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
France	70, 810	10, 793	76, 820	13, 293	86, 208	13, 336	69, 791	14, 374	106, 706	7, 338
China	70, 538	0	44, 326	0	41, 369	0	110, 880	0	108, 591	0
Germany	58, 861	8, 040	83, 763	3, 207	113, 267	4, 008	86, 785	3, 379	47, 350	3, 547
Dutch East Indies	4, 262	1, 676	9, 976	1, 779	7, 011	1, 951	4, 703	2, 438	4, 796	2, 354
Denmark	*4, 046*	*1, 203*	*5, 137*	*838*	*8, 781*	*800*	*9, 963*	*1, 846*	*11, 490*	*1, 266*
Total	208, 517	21, 712	220, 022	19, 117	256, 636	20, 095	282, 122	22, 036	278, 983	14, 505
PRINCIPAL IMPORTING COUNTRIES										
Netherlands	31, 567	58, 871	34, 865	71, 505	35, 005	60, 846	34, 939	34, 287	36, 479	9, 072
United Kingdom	21, 326	37, 167	25, 753	35, 056	23, 903	49, 542	6, 895	49, 820	10, 667	42, 291
Algeria	364	29, 416	190	34, 884	515	43, 152	[2] 1, 402	45, 122	------	54, 157
Canada	0	20, 902	0	14, 187	0	31, 037	0	56, 556	0	45, 127
Italy	114	13, 388	82	18, 053	106	8, 318	148	1, 211	130	2, 076
Belgium	4, 343	9, 717	3, 532	10, 082	2, 742	15, 970	2, 310	22, 883	3, 409	21, 936
Norway	0	7, 782	0	7, 505	0	7, 746	0	4, 422	0	3, 804
Sweden	2, 177	7, 275	2, 819	6, 729	1, 959	10, 009	1, 602	9, 353	1, 388	9, 081
United States	0	4, 427	0	4, 749	0	3, 231	0	15, 565	0	14, 836
Tunis	0	4, 283	0	4, 540	0	4, 557	0	1, 694	0	4, 594
Philippine Islands	*0*	*4, 163*	*0*	*3, 892*	*0*	*4, 123*	*0*	*3, 714*	*0*	*5, 919*
Czechoslovakia	396	3, 360	280	3, 903	1, 515	6, 443	783	5, 650	739	5, 377
Finland	*0*	*2, 367*	*0*	*3, 004*	*0*	*3, 574*	*0*	*2, 774*	*0*	------
Morocco	0	1, 876	0	1, 483	0	3, 237	0	7, 267	0	6, 430
Total	60, 277	205, 086	67, 521	219, 662	65, 835	251, 784	48, 169	260, 318	52, 812	226, 248

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] Preliminary. [2] International Yearbook of Agricultural Statistics.

TABLE 295.—*Peanut oil, refined: Average price per pound, in barrels, New York, 1923–24 to 1932–33*

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923–24	16.00	16.00	15.59	14.80	14.75	14.75	14.75	14.75	14.88	15.25	15.25	15.56	15.10
1924–25	*16.45*	*16.25*	*16.25*	*16.25*	*16.75*	*16.75*	*16.75*	*16.75*	*15.20*	*15.00*	*15.00*	*15.00*	*16.03*
1925–26	15.00	15.00	15.00	15.00	15.00	15.50	16.00	16.00	16.00	16.00	16.00	16.00	15.54
1926–27	*16.00*	*16.00*	*15.50*	*14.62*	*14.50*	*14.50*	*14.50*	*14.50*	*14.50*	*14.50*	*14.50*	*14.50*	*14.84*
1927–28	14.50	14.50	14.30	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.50	13.73
1928–29	*13.50*	*13.50*	*12.25*	*11.00*	*13.50*	*13.50*	*13.50*	*13.41*	*13.25*	*13.25*	*13.25*	*13.25*	*13.10*
1929–30	*13.25*	*13.25*	*13.25*	*13.25*	*12.85*	*12.75*	*12.75*	*12.35*	*11.75*	*11.75*	*11.75*	*11.75*	*12.58*
1930–31	11.38	13.50	13.50	13.50	13.50	13.50	13.50	13.10	12.50	12.50	12.50	12.50	12.96
1931–32	12.50	10.30	10.35	10.38	10.38	10.38	10.38	10.38	9.62	9.62	9.62	10.28	10.35
1932–33	10.50	10.35	9.50	9.50	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from *Oil, Paint, and Drug Reporter*, average of weekly range. See 1930 Yearbook, p. 817, Table 334, for data for earlier years.

TABLE 296.—*Peas, dry field:*[1] *Acreage, yield per acre, and production, by States, 1930–1932*

State	Acreage harvested			Yield per acre			Production		
	1930	1931	1932[2]	1930	1931	1932	1930	1931	1932[2]
	1,000 acres	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Michigan	28	15	19	11.0	8.5	10.0	308	128	190
Wisconsin	30	25	18	14.5	10.5	12.5	435	262	225
Montana	30	33	28	17.5	13.5	13.0	525	446	364
Idaho	64	55	48	20.0	19.0	20.0	1,280	1,045	960
Colorado	49	49	54	12.0	9.0	12.0	588	441	648
United States	201	177	167	15.6	13.1	14.3	3,136	2,322	2,387

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] These figures are for the States in which peas are grown commercially in material quantities.
[2] Preliminary.

TABLE 297.—*Clover seed (red and alsike), sweetclover seed, Lespedeza (Japan clover) seed, and alfalfa seed: Acreage, yield, production, and weighted average price, by States, 1930–1932*

CLOVER SEED (RED AND ALSIKE)

State	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season[1]		
	1930	1931	1932[2]	1930	1931	1932	1930	1931	1932[2]	1930	1931	1932
	Acres	*Acres*	*Acres*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Dolls.*	*Dolls.*	*Dolls.*
N. Y.	2,700	4,000	5,000	1.9	1.6	1.5	5,100	6,400	7,500	14.20	10.30	8.50
Pa.	8,000	12,000	15,000	1.5	1.7	1.6	12,000	20,400	24,000	14.30	11.90	8.40
Ohio	107,000	160,000	208,000	1.0	1.4	1.7	107,000	224,000	353,600	12.30	7.60	4.45
Ind.	149,000	131,000	203,000	.9	1.0	1.5	134,100	131,000	304,500	12.00	6.90	4.35
Ill.	162,000	121,000	230,000	1.1	1.2	1.3	178,200	145,200	299,000	12.00	7.20	4.45
Mich.	100,000	65,000	104,000	1.2	1.35	1.45	120,000	87,800	150,800	12.30	7.20	4.65
Wis.	138,500	61,000	44,000	1.4	1.0	1.2	193,900	61,000	52,800	11.40	7.60	5.60
Minn.	96,000	87,000	65,200	2.0	1.1	2.2	192,000	95,700	143,400	11.60	7.10	4.85
Iowa	118,000	78,000	55,000	1.25	.75	1.1	147,500	58,500	60,500	11.70	7.80	4.70
Mo.	63,000	50,000	40,000	1.2	1.2	1.2	75,600	60,000	48,000	11.50	7.80	5.50
N. Dak.	1,000	1,000	1,100	3.0	1.5	1.5	3,000	1,500	1,600	12.70	7.70	5.10
Nebr.	17,300	12,000	10,000	1.8	1.6	1.6	31,100	19,200	16,600	11.30	7.10	4.60
Kans.	17,000	8,500	5,000	1.6	1.5	1.2	27,200	12,800	6,000	10.50	6.90	5.30
Md.	5,000	(3)	28,000	1.4	------	1.5	7,000	------	42,000	14.00	------	5.00
Va.	5,000	(3)	27,000	.3	------	1.3	1,500	------	35,100	14.20	------	9.80
Ky.	3,000	1,000	1,000	1.1	2.0	1.0	3,300	2,000	1,000	14.10	8.50	5.40
Tenn.	3,000	3,000	3,000	2.0	1.5	1.5	6,000	4,500	4,500	12.80	7.70	5.70
Idaho	38,000	34,000	21,000	4.5	4.0	4.0	171,000	136,000	84,000	9.80	6.30	4.50
Wyo.	2,500	2,600	2,500	5.0	1.5	2.0	12,500	3,900	5,000	11.10	7.10	4.65
Colo.	2,000	2,000	2,000	5.0	4.5	3.0	10,000	9,000	6,000	9.60	6.40	4.70
Oreg.	17,000	17,000	17,000	3.1	3.5	2.5	52,700	59,500	42,500	10.90	6.40	5.20
U. S.	1,055,000	850,100	1,086,800	1.41	1.34	1.55	1,490,700	1,138,400	1,687,800	11.55	7.27	4.79

SWEETCLOVER SEED

State	Acreage 1930	Acreage 1931	Acreage 1932	Yield 1930	Yield 1931	Yield 1932	Production 1930	Production 1931	Production 1932	Price 1930	Price 1931	Price 1932
Ohio	4,000	5,000	6,000	2.9	2.4	2.9	11,600	12,000	17,400	4.20	3.00	1.85
Ind.	2,000	2,000	3,000	3.0	3.0	3.0	6,000	6,000	9,000	4.10	3.60	2.20
Ill.	14,000	13,000	13,000	3.3	2.6	2.5	46,200	33,800	32,500	4.00	3.40	2.05
Wis.	5,000	1,600	400	4.5	3.7	3.0	22,500	5,900	1,200	4.60	3.60	2.35
Minn.	32,000	41,000	33,600	4.5	5.0	4.3	144,000	205,000	144,500	3.30	2.20	1.10
Iowa	10,000	10,000	11,000	3.9	3.5	3.1	39,000	35,000	34,100	4.40	3.40	1.50
Mo.	2,000	2,000	2,000	3.0	3.0	2.3	6,000	6,000	4,600	4.20	3.20	2.50
N. Dak.	64,000	70,000	48,000	3.8	3.0	2.5	243,200	210,000	120,000	3.30	2.60	1.25
S. Dak.	43,000	59,000	26,000	3.7	2.4	3.5	159,100	141,600	91,000	3.20	2.60	1.10
Nebr.	16,200	24,000	19,000	4.2	4.4	3.0	68,000	105,600	57,000	3.20	2.70	1.35
Kans.	18,000	14,000	10,000	3.9	3.7	3.3	70,200	51,800	33,000	3.10	2.40	1.65
Mont.	5,000	2,500	5,000	3.0	3.0	2.5	15,000	7,500	12,500	4.10	4.00	2.25
Colo.	3,500	3,500	3,500	5.0	5.0	4.5	17,500	17,500	15,800	3.70	3.10	2.35
U. S.	218,700	247,600	180,500	3.88	3.38	3.17	848,300	837,700	572,600	3.43	2.61	1.38

[1] Dec. 1 price for Lespedeza seed. [2] Preliminary. [3] Less than 1,000 acres.

TABLE 297.—*Clover seed (red and alsike), sweetclover seed, Lespedeza (Japan clover) seed, and alfalfa seed: Acreage yield, production, and weighted average price, by States, 1930–1932*—Continued

LESPEDEZA (JAPAN CLOVER) SEED

State	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop marketing season [1]		
	1930	1931	1932 [1]	1930	1931	1932	1930	1931	1932 [1]	1930	1931	1932
	Acres	*Acres*	*Acres*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Dolls.*	*Dolls.*	*Dolls.*
N. C.	15,000	25,000	40,000	3.5	4.65	4.0	52,500	116,200	160,000	2.90	2.75	1.50
Ky.	3,000	2,500	2,000	3.0	4.0	4.0	9,000	10,000	8,000	2.75	2.30	1.00
Tenn.	18,000	40,000	28,000	3.0	4.0	4.0	54,000	160,000	112,000	2.75	2.50	1.50
Miss.	2,700	3,500	2,400	3.0	4.5	3.8	8,100	15,800	9,100	2.75	2.30	1.00
La.	3,000	2,000	1,200	1.5	4.5	4.0	4,500	9,000	4,800	3.25	2.65	1.75
U. S.	41,700	73,000	73,600	3.07	4.26	3.99	128,100	311,000	293,900	2.83	2.58	1.47
ALFALFA SEED												
Mich.	8,000	15,000	12,000	3.0	3.0	1.5	24,000	45,000	18,000	12.40	8.40	0.80
Wis.	16,400	16,400	13,100	1.7	1.3	1.2	27,900	21,300	15,700	13.40	11.10	9.00
Minn.	33,000	33,000	36,300	1.5	1.5	1.5	49,500	49,500	54,400	14.20	9.60	7.10
N. Dak.	18,200	9,000	12,000	1.5	1.4	1.2	27,300	12,600	14,400	13.10	10.40	7.40
S. Dak.	51,200	30,000	14,000	1.9	1.6	1.7	97,300	48,000	23,800	12.50	9.00	6.40
Nebr.	28,000	37,000	26,000	2.2	2.6	1.6	61,600	96,200	41,600	10.40	7.30	4.85
Kans.	57,800	48,000	36,000	3.2	2.5	2.0	185,000	120,000	72,000	8.90	6.10	4.55
Okla.	14,500	13,100	11,800	4.0	3.0	3.0	58,000	39,300	35,400	8.40	8.00	3.45
Tex.	2,600	1,900	2,000	2.8	2.4	2.5	7,300	4,600	5,000	9.20	8.80	3.30
Mont.	66,000	33,000	23,100	2.6	1.4	1.3	171,600	46,200	30,000	12.00	8.40	6.70
Idaho.	40,000	33,000	17,000	3.75	3.0	2.5	150,000	99,000	42,500	9.70	7.00	6.10
Wyo.	11,500	10,800	14,000	3.7	2.0	2.0	42,600	21,600	28,000	10.70	7.40	5.60
Colo.	21,500	9,700	10,000	3.0	3.0	2.5	64,500	29,100	25,000	9.80	6.30	5.10
N. Mex.	2,800	3,100	3,200	3.0	3.3	3.2	8,400	10,200	10,200	10.10	6.10	4.75
Ariz.	14,000	14,000	14,000	5.0	4.0	4.0	70,000	56,000	56,000	10.10	6.20	3.60
Utah.	35,000	32,000	15,000	1.2	1.8	1.2	42,000	57,600	18,000	9.10	5.30	5.10
Oreg.	3,000	3,000	3,000	3.0	4.0	3.5	9,000	12,000	10,500	14.20	7.60	7.50
Calif.	17,400	19,100	12,500	4.0	3.7	3.0	69,600	70,700	37,500	12.00	6.90	4.50
U. S.	440,900	361,100	275,000	2.64	2.32	1.96	1,165,600	838,900	538,000	10.75	7.34	5.41

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Dec. 1 price for Lespedeza seed.

TABLE 298.—*Clover seed: Receipts, Chicago, 1923–24 to 1932–33*

Crop year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923–24	641	1,681	1,176	1,039	630	1,641	2,054	1,352	259	41	1	40	10,555
1924–25	346	888	2,195	1,801	1,500	1,507	1,574	765	9	27	68	328	11,008
1925–26	393	946	2,125	2,603	1,984	2,079	2,888	849	487	28	107	366	14,855
1926–27	1,107	3,596	2,133	1,350	1,695	1,857	1,671	546	55	------	------	64	14,074
1927–28	575	2,285	4,689	1,544	1,557	1,522	1,313	848	268	40	165	168	14,974
1928–29	958	3,125	2,751	1,746	790	1,431	1,616	959	68	110	160	56	13,770
1929–30	1,225	1,883	2,121	1,269	758	1,204	1,588	1,112	232	102	76	360	16,915
1930–31	985	1,513	1,782	705	1,224	1,093	1,886	1,916	230	84	464	471	12,353
1931–32	1,150	573	2,022	1,505	800	1,818	1,694	1,389	741	268	313	566	12,739
1932–33	914	1,649	657	801	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 299.—*Alfalfa seed: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted average [1]
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	10.25	10.38	9.20	10.75	10.21	10.19	10.43	10.51	11.17	11.41	11.67	11.39	10.40
1924–25	11.13	10.99	10.74	10.39	10.16	10.33	10.52	11.05	11.72	12.73	12.00	10.99	10.77
1925–26	11.41	9.88	10.51	10.30	10.65	9.87	9.51	9.48	9.82	9.94	9.92	10.22	10.14
1926–27	9.79	9.37	9.17	8.94	9.42	9.48	10.12	10.33	10.50	11.04	10.63	10.62	9.54
1927–28	10.17	9.62	9.69	9.78	9.45	9.76	9.55	9.74	10.11	10.35	10.52	10.91	9.76
1928–29	10.24	10.38	10.25	10.71	11.96	12.69	12.67	13.19	13.84	14.19	14.69	14.91	11.35
1929–30	14.68	13.52	12.85	11.68	10.83	11.10	11.15	11.16	11.97	11.97	12.38	12.05	11.78
1930–31	12.10	11.91	11.36	10.68	10.18	9.86	9.97	10.20	9.91	9.89	9.70	9.64	10.66
1931–32	9.98	9.69	8.35	6.94	6.58	6.97	6.36	6.58	6.70	6.79	6.58	6.47	7.43
1932–33	6.53	5.98	5.59	5.25	5.19	5.42	----	----	----	----	----	----	----

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly price obtained by weight ing monthly prices by monthly marketings.

[1] Straight crop year average until 1924. For previous data see 1930 or earlier Yearbooks.

TABLE 300.—*Clover seed, red: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	11.07	12.20	12.18	12.22	12.51	12.67	13.04	13.09	13.07	12.72	12.42	12.09	12.14
1924–25	12.15	12.80	13.42	15.31	16.17	16.95	18.19	17.40	16.82	15.48	15.67	14.86	14.21
1925–26	13.42	14.42	14.85	15.48	16.04	16.83	17.45	17.88	18.08	17.16	17.17	16.83	15.27
1926–27	16.63	17.21	17.85	17.89	19.07	20.18	21.16	22.75	22.45	22.07	20.69	17.94	18.20
1927–28	16.78	15.67	15.07	15.33	15.97	16.37	16.90	16.92	17.04	16.89	16.42	15.90	15.98
1928–29	16.26	16.49	16.68	16.81	16.96	17.37	17.54	17.96	17.90	17.62	17.17	16.30	16.89
1929–30	12.48	10.68	9.75	9.94	9.92	9.95	10.03	10.23	10.23	10.40	10.34	11.01	10.48
1930–31	11.65	12.47	12.35	11.76	11.78	11.64	11.54	11.59	11.80	11.84	10.76	10.06	11.80
1931–32	7.99	6.73	6.97	7.34	7.27	7.31	7.58	7.69	7.58	7.19	6.77	5.79	7.33
1932–33	5.34	4.70	4.61	4.67	----	----	----	----	----	----	----	----	----

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly prices obtained by weighting monthly prices by average monthly marketings. For previous data see 1930 or earlier Yearbooks.

TABLE 301.—*Timothy seed: Acreage, yield, production, and weighted average price, by States, 1930–1932*

State	Acreage harvested			Yield per acre			Production			Weighted average price per bushel, crop-marketing season		
	1930	1931	1932 [1]	1930	1931	1932	1930	1931	1932 [1]	1930	1931	1932
	Acres	*Acres*	*Acres*	*Bush.*	*Bush.*	*Bush.*	*Bushels*	*Bushels*	*Bushels*	*Dolls.*	*Dolls.*	*Dolls.*
Pennsylvania	4,000	4,000	4,000	2.6	3.1	2.5	10,400	12,400	10,000	3.70	3.00	2.20
Ohio	13,000	26,000	23,000	3.2	4.2	3.5	41,600	109,200	80,500	3.20	1.40	1.05
Indiana	4,000	15,000	9,000	2.2	3.5	3.5	8,800	52,500	31,500	3.00	1.80	1.25
Illinois	59,000	71,000	57,000	2.9	3.4	3.0	171,100	241,400	171,000	2.70	1.40	.90
Wisconsin	18,000	14,000	11,500	3.8	3.0	4.0	68,400	42,000	46,000	3.10	1.80	1.35
Minnesota	44,000	44,900	50,000	4.2	3.5	4.6	184,800	157,200	230,000	2.40	1.50	.80
Iowa	206,400	248,000	220,000	5.0	4.3	4.6	1,032,000	1,066,400	1,012,000	2.40	1.30	.85
Missouri	72,000	80,000	64,000	2.8	4.4	3.0	201,600	352,000	192,000	2.50	1.40	.90
North Dakota	2,500	2,500	1,400	3.0	2.0	2.3	7,500	5,000	3,200	2.60	2.00	.95
South Dakota	5,300	3,400	2,000	2.6	2.3	2.5	13,890	7,800	5,000	2.30	1.80	.85
United States	428,200	508,800	441,900	4.06	4.02	4.03	1,740,000	2,045,900	1,781,200	2.50	1.39	.89

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 302.—*Timothy seed: Receipts, Chicago, 1923–24 to 1932–33*

Crop year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923–24	5, 386	13, 397	4, 419	1, 606	1, 329	662	1, 298	1, 815	1, 162	65	315	507	31, 961
1924–25	3, 698	12, 714	4, 845	3, 736	1, 552	2, 138	2, 038	2, 566	1, 809	1, 240	664	687	37, 687
1925–26	5, 933	7, 599	5, 009	2, 047	1, 651	2, 499	1, 801	2, 316	1, 734	1, 015	667	672	32, 943
1926–27	5, 907	7, 981	3, 368	2, 113	1, 158	1, 588	1, 780	2, 601	1, 481	980	779	516	30, 252
1927–28	6, 548	7, 387	3, 741	3, 812	961	1, 170	1, 669	1, 826	1, 625	1, 613	1, 039	896	32, 287
1928–29	1, 652	5, 664	3, 164	956	921	820	650	802	471	335	311	103	15, 849
1929–30	3, 519	3, 363	2, 026	1, 915	809	600	920	1, 229	926	901	109	168	16, 485
1930–31	7, 079	8, 999	3, 451	1, 701	825	317	862	1, 184	2, 227	142	------	------	26, 787
1931–32	13, 668	13, 771	6, 858	3, 037	2, 642	922	2, 321	1, 831	2, 675	1, 651	286	197	49, 859
1932–33	6, 177	10, 642	6, 223	1, 163	759	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 303.—*Timothy seed: Estimated average price per bushel received by producers, United States, 1923–24 to 1932–33*

Crop year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	2. 63	3. 01	3. 12	3. 15	3. 19	3. 37	3. 56	3. 60	3. 54	3. 48	3. 44	3. 23	2. 93
1924–25	3. 20	3. 12	3. 16	2. 88	3. 03	3. 04	3. 03	3. 15	3. 24	3. 10	3. 05	3. 47	3. 15
1925–26	3. 36	3. 21	3. 21	3. 31	3. 41	3. 38	3. 56	3. 51	3. 47	3. 36	3. 41	3. 26	3. 34
1926–27	2. 68	2. 55	2. 61	2. 46	2. 68	2. 62	2. 70	2. 69	2. 76	2. 69	2. 76	2. 58	2. 62
1927–28	2. 06	1. 66	1. 58	1. 61	1. 73	1. 78	1. 92	1. 86	1. 88	1. 96	2. 08	2. 07	1. 88
1928–29	1. 86	1. 91	2. 08	2. 20	2. 20	2. 41	2. 49	2. 62	2. 67	2. 65	2. 56	2. 38	2. 00
1929–30	1. 69	1. 88	2. 02	2. 17	2. 25	2. 46	2. 37	2. 51	2. 67	2. 69	2. 65	2. 53	1. 92
1930–31	2. 51	2. 62	3. 06	3. 11	3. 09	3. 29	3. 32	3. 58	3. 61	3. 43	3. 16	2. 33	2. 80
1931–32	1. 38	1. 43	1. 44	1. 46	1. 54	1. 53	1. 62	1. 70	1. 59	1. 61	1. 39	1. 20	1. 43
1932–33	. 91	. 93	. 88	. 92	. 95	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by production to obtain a price for the United States; yearly prices obtained by weighting monthly prices by average monthly marketings. For previous data see 1930 or earlier Yearbooks.

TABLE 304.—*Seeds: Average price per 100 pounds, specified markets, 1923–1932*

Season, January–May	Alfalfa, Kansas City	Alsike clover, Chicago	Red clover, Chicago	Kentucky blue-grass, Kansas City	Timothy, Chicago	Sweet-clover, Minneapolis	Meadow fescue, Kansas City	Lespedeza, Louisville	German millet, Kansas City	Amber sorgo, Kansas City	Hairy vetch, Baltimore	Sudan grass, Kansas City
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	20. 03	16. 46	20. 93	25. 88	7. 02	12. 41	10. 00	18. 98	3. 76	4. 25	16. 81	14. 28
1924	22. 26	15. 66	20. 87	25. 09	7. 96	15. 28	10. 58	20. 78	3. 80	1. 74	10. 45	8. 22
1925	22. 84	23. 38	33. 97	28. 00	6. 79	12. 34	9. 42	19. 50	4. 98	2. 24	8. 82	5. 69
1926	20. 40	27. 55	33. 67	38. 05	7. 94	9. 65	15. 49	15. 74	3. 10	2. 72	12. 25	4. 31
1927	19. 90	37. 42	42. 54	20. 53	5. 97	13. 65	25. 00	8. 57	3. 25	3. 10	15. 10	6. 08
1928	21. 90	27. 80	30. 65	19. 72	4. 74	8. 55	14. 70	17. 65	2. 45	1. 99	9. 72	3. 62
1929	26. 04	34. 65	33. 63	31. 31	6. 54	8. 50	16. 01	20. 43	3. 44	2. 09	9. 30	5. 80
1930	24. 81	19. 99	21. 35	20. 00	8. 06	8. 00	10. 00	14. 37	3. 45	3. 47	9. 00	5. 40
1931	22. 56	23. 88	25. 04	34. 37	10. 55	9. 22	10. 76	14. 69	3. 69	2. 81	8. 45	7. 38
1932	13. 65	15. 05	16. 35	13. 45	4. 30	5. 50	5. 50	8. 30	1. 75	1. 15	7. 50	1. 70

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 305.—*Field seeds: Average wholesale price per 100 pounds at specified markets, by months, 1923–1932*

Season, January–May	Alfalfa, common, Kansas City					Alsike clover, Chicago				
	Jan.	Feb.	Mar.	Apr.	May	Jan.	Feb.	Mar.	Apr.	May
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1923	19.50	19.50	19.50	20.65	21.00	16.50	16.50	16.50	16.45	16.35
1924	21.50	21.50	22.30	23.00	23.00	15.55	15.45	15.45	15.85	16.00
1925	22.00	22.10	23.10	23.50	23.50	21.75	22.35	23.05	24.75	25.00
1926	20.00	20.00	20.00	21.00	21.00	26.10	27.25	27.85	28.20	28.40
1927	19.50	20.00	20.00	20.00	20.00	36.00	37.95	39.45	38.85	34.85
1928	21.50	22.00	22.00	22.00	22.00	28.35	28.10	27.80	27.70	27.10
1929	26.00	26.00	26.20	26.00	26.00	34.65	33.90	35.15	35.45	34.15
1930	23.55	24.75	25.25	25.25	25.25	20.10	19.90	19.50	20.10	19.90
1931	22.90	22.50	22.50	22.50	22.50	23.70	24.00	23.75	23.20	22.75
1932	13.50	13.50	13.50	13.80	14.00	15.50	15.30	15.00	14.75	14.65
	Red clover, Chicago					Sweetclover, Minneapolis				
1923	22.55	22.45	20.60	19.70	19.35	12.40	12.00	12.40	13.00	12.25
1924	23.10	21.55	21.10	19.60	19.00	15.00	15.00	15.40	15.90	15.10
1925	34.20	36.00	34.30	33.35	32.00	13.00	13.00	12.75	11.95	11.00
1926	32.15	30.50	34.70	34.00	34.00	9.00	9.45	9.85	9.95	10.00
1927	38.60	42.30	45.00	44.25	42.55	14.35	14.35	14.00	13.10	12.50
1928	32.60	30.95	29.95	30.20	29.70	8.75	8.70	8.45	8.45	8.40
1929	33.00	33.20	34.40	34.35	33.20	8.50	8.50	8.50	8.50	8.50
1930	21.20	21.35	21.00	21.60	21.60	8.00	8.00	8.00	8.00	8.00
1931	26.00	26.05	25.45	24.15	23.55	9.50	9.40	9.15	9.05	9.00
1932	16.80	16.50	16.25	16.15	16.10	5.75	5.50	5.50	5.50	5.25
	Kentucky bluegrass, Kansas City					Timothy, Chicago				
1923	25.00	25.00	25.00	26.90	27.50	7.00	7.00	7.05	7.05	7.00
1924	25.10	25.35	25.00	25.00	25.00	8.15	8.25	8.10	7.75	7.55
1925	28.00	28.00	28.00	28.00	28.00	6.95	6.70	6.50	6.85	6.95
1926	40.00	39.25	37.00	37.00	37.00	8.10	8.10	7.95	7.80	7.75
1927	20.25	21.00	21.00	20.40	20.00	6.05	6.05	5.85	5.95	5.95
1928	19.50	19.50	19.60	20.00	20.00	4.75	4.55	4.35	4.75	5.30
1929	31.50	30.75	31.30	31.50	31.50	6.75	6.70	6.62	6.45	6.15
1930	20.00	20.00	20.00	20.00	20.00	7.10	7.20	7.30	8.25	10.45
1931	34.10	34.25	34.50	34.50	34.50	10.20	10.45	10.45	10.70	10.95
1932	13.00	13.25	13.60	13.75	13.75	4.65	4.40	4.25	4.05	4.00

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling price for high-quality seed.

TABLE 306.—*Forage plant seed:*[1] *Imports into United States, 1922–23 to 1931–32*

Kind of seed	Year beginning July									
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Alfalfa	8,784	12,818	4,783	4,548	5,134	782	1,146	337	233	353
Canada bluegrass	836	817	1,150	284	882	1,102	1,228	608	985	366
Awnless bromegrass				11		(2)	5	4	4	
Alsike clover	5,566	11,056	10,425	10,989	4,163	7,609	4,798	7,220	94	
Crimson clover	2,262	7,745	4,834	5,766	2,385	1,346	8,395	3,099	3,079	1,831
Red clover	448	24,729	6,541	19,725	10,816	4,641	7,547	2,154	2,805	31
White clover	520	1,408	1,227	1,666	975	1,778	2,410	2,276	768	893
Biennial white sweetclover	3,567	4,039	3,493	5,879	4,130	3,379	1,464	206		
Biennial yellow sweetclover	7	222	52	502	174	116	29	3		
Clover mixtures	20	74	13	122	24	41	250	32	16	16
Grass mixtures	(2)	(2)	(2)	(2)			5	5	1	3
Meadow fescue		(2)	1	13	16	(2)	8	1		(2)
Broomcorn millet	5,361	595	253	456	(3)	(3)	(3)	(3)	(3)	(3)
Foxtail millet	65	184	243	125		30	108			
Orchard grass	768	603	992	253	260	173	2,377	318	342	1
Rape, winter	6,384	6,600	4,345	6,526	6,788	6,438	6,982	6,681	5,119	3,762
Perennial ryegrass	1,834	1,952	1,335	2,302	1,203	1,083	1,180	937	824	646
Italian ryegrass	860	1,034	831	1,683	833	456	300	244	200	75
Timothy	32	(2)	1	3	45	23	(2)	37		
Hairy vetch	1,599	3,215	2,068	3,986	2,124	3,895	4,064	2,483	1,628	2,365
Spring vetch	1,858	1,210	1,266	1,603	992	563	1	821	704	202

Bureau of Agricultural Economics. Compiled from data of the Division of Seed Investigations, Bureau of Plant Industry.

[1] Imports reported represent principal forage plant seed only; imports of others are small.
[2] Less than 500 pounds.
[3] Data not compiled.

STATISTICS OF BEEF CATTLE, HOGS, SHEEP, HORSES, MULES, AND ASSES

TABLE 307.—*Cattle and calves: Estimated number on farms and value per head in the United States, January 1, 1900–1933*

Year	Cattle and calves			Year	Cattle and calves		
	All [1]	Other than milk cows			All [1]	Other than milk cows	
		Number [2]	Value per head Jan. 1 [3]			Number [2]	Value per head Jan. 1 [3]
	Thous.	*Thous.*	*Dollars*		*Thous.*	*Thous.*	*Dollars*
1900 [4]	43,902	27,610	----------	1917	69,533	48,902	33.91
1900 [5]	*67,720*	*50,584*	----------	1918	71,229	50,208	38.03
1900	57,518	42,265	23.60	1919	70,281	49,042	41.79
1901	60,544	45,023	18.83	1920 [5]	*66,639*	*46,834*	----------
1902	62,215	46,428	17.73	1920	70,325	48,870	40.01
1903	63,788	47,715	17.44	1921	68,633	47,103	29.05
1904	64,137	47,678	15.42	1922	68,663	46,841	21.89
1905	64,003	47,161	14.32	1923	67,384	45,285	23.41
1906	62,872	45,505	14.98	1924	65,832	43,544	23.03
1907	62,373	44,723	16.16	1925 [5]	*60,760*	*43,115*	----------
1908	60,794	42,867	15.96	1925	63,115	40,010	22.67
1909	59,634	41,480	16.63	1926	59,077	37,668	20.40
1910 [5]	*61,803*	*41,178*	----------	1927	57,528	35,369	28.12
1910	57,940	39,734	18.02	1928	56,701	34,672	36.30
1911	56,219	37,975	19.41	1929	57,878	35,548	42.03
1912	55,022	36,710	20.03	1930 [5]	*63,896*	*43,397*	----------
1913	55,833	37,307	24.91	1930	59,730	36,820	40.44
1914	56,737	39,807	29.42	1931	60,987	37,411	28.08
1915	62,532	43,006	31.54	1932	62,656	38,187	18.34
1916	66,394	48,330	31.69	1933 [6]	65,129	39,993	14.13

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Figures for 1900–1919 are tentative revised estimates.
[2] Obtained by subtracting the estimates of "milk cows on farms" shown in Table 373 from the estimates of "all cattle on farms" shown in this table.
[3] Data for 1900–1925 are an old series adjusted on basis average relationship between the old and new series from 1926 to 1928. Old series was weighted averages of prices by age groups only and was shown in 1928 Yearbook. *The conversion factor was 0.9466 (base is old series). Data for 1926–1933 are a new series referred to* above, of average values by age and sex classification weighted by numbers in each class.
[4] Original estimate of the Bureau of Agricultural Economics.
[5] Italic figures are from the census. 1900, 1910, and 1930 include spring-born calves. Census dates were June 1, 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925; Apr. 1, 1930.
[6] Preliminary.

163050°—33——38

TABLE 308.—*Cattle and calves, including cows and heifers kept for milk: Estimated number on farms and value per head, by States, January 1, 1931–1933*

State and division	Number			Value per head [1]		
	1931	1932	1933 [2]	1931	1932	1933
	Thous.	*Thous.*	*Thous.*	*Dollars*	*Dollars*	*Dollars*
Maine	242	249	251	51.20	37.20	26.40
New Hampshire	127	131	129	67.90	45.00	33.80
Vermont	428	435	437	61.30	41.00	30.80
Massachusetts	182	186	186	98.20	70.30	50.30
Rhode Island	29	29	29	98.60	71.20	54.50
Connecticut	153	159	160	88.10	67.30	49.10
New York	1,956	1,986	2,042	69.20	49.70	39.10
New Jersey	160	163	170	104.00	73.50	51.10
Pennsylvania	1,357	1,398	1,412	63.50	47.20	33.20
North Atlantic	4,634	4,736	4,816	68.97	49.73	37.09
Ohio	1,562	1,610	1,691	46.80	34.60	24.90
Indiana	1,360	1,428	1,500	42.50	30.40	22.60
Illinois	2,265	2,361	2,455	48.30	31.70	24.10
Michigan	1,370	1,390	1,418	47.70	34.80	25.80
Wisconsin	3,150	3,213	3,198	51.80	34.60	24.20
East North Central	9,713	10,002	10,262	48.30	33.34	24.29
Minnesota	3,151	3,246	3,343	41.70	25.60	18.30
Iowa	4,063	4,200	4,284	42.40	26.60	19.90
Missouri	2,542	2,660	2,664	34.70	23.80	18.50
North Dakota	1,398	1,566	1,691	34.90	22.60	16.60
South Dakota	1,946	1,925	2,098	37.30	21.90	17.00
Nebraska	3,167	3,138	3,358	39.00	24.20	18.70
Kansas	3,141	3,298	3,463	33.40	22.00	17.50
West North Central	19,408	20,033	20,901	38.21	24.17	18.32
North Central	29,121	30,035	31,163	41.58	27.22	20.28
Delaware	49	49	50	65.30	46.20	30.90
Maryland	277	277	282	61.10	41.20	29.00
Virginia	754	792	816	33.90	27.80	21.10
West Virginia	500	510	525	36.00	28.60	22.40
North Carolina	532	551	588	35.90	27.10	20.60
South Carolina	261	274	290	33.10	23.60	19.50
Georgia	773	811	852	23.90	16.60	12.30
Florida	432	458	480	23.70	18.00	14.00
South Atlantic	3,578	3,723	3,883	33.58	25.09	18.99
Kentucky	1,010	1,040	1,071	31.80	23.70	18.00
Tennessee	992	1,032	1,094	28.80	20.50	15.30
Alabama	771	810	875	22.40	15.80	11.80
Mississippi	937	993	1,052	20.30	14.30	10.20
Arkansas	773	848	915	19.20	16.20	12.70
Louisiana	705	740	784	22.70	18.20	13.10
Oklahoma	2,010	2,131	2,280	25.40	18.70	14.10
Texas	6,127	6,127	6,495	23.90	17.30	13.40
South Central	13,325	13,721	14,566	24.41	17.92	13.61
Montana	1,263	1,276	1,378	38.80	24.10	20.90
Idaho	636	661	687	40.70	24.60	19.50
Wyoming	830	863	906	40.30	24.50	19.90
Colorado	1,541	1,526	1,526	37.80	22.50	16.10
New Mexico	1,100	1,144	1,167	30.30	21.30	15.20
Arizona	795	851	894	33.20	22.30	16.50
Utah	475	475	480	40.30	22.70	19.60
Nevada	320	310	295	38.70	25.70	21.10
Washington	591	615	646	47.90	37.00	26.50
Oregon	772	795	835	40.70	29.80	21.10
California	2,006	1,926	1,887	51.50	33.90	25.50
Western	10,329	10,442	10,701	40.75	26.46	20.11
United States	60,987	62,656	65,129	39.30	26.63	19.93

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Sum of total value of subgroups (classified by age and sex) divided by total number and rounded to nearest dime for States. Division and United States averages not rounded. State figures are new weighted value series not comparable to State figures previously published for the years prior to 1925.

[2] Preliminary.

TABLE 309.—*Cattle: Number in countries having 150,000 or over, average 1921–1925, annual 1926–1931*

Country	Month of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
North America and West Indies:		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
United States	January	66,725	59,977	57,528	56,701	57,878	59,730	60,987
Canada	June	9,588	8,571	9,172	8,793	8,825	8,937	7,991
Mexico	do	[3] 2,492	5,585				[3] 3,735	
Guatemala	July	268	564	310	298	396	416	
Honduras		[4] 466						
Salvador		(340)					[3] 328	
Nicaragua		[5] 1,200						
Costa Rica		435	423	478	443	399		
Cuba	Jan. 1 [6]	4,841	3,783	4,704	4,729	4,421	4,845	4,377
Dominican Republic	May	640			488			
Puerto Rico		279			141	141		
Estimated total [7]		87,900						
South America:								
Colombia		7,468	6,500	6,727			7,343	
Venezuela		2,689					[5] 3,000	
British Guiana		117	138	141	154	151	154	
Ecuador		[5] 1,500	1,280			[5] 1,285		
Peru	February	1,198				[3] 1,806		
Bolivia		2,145	2,320	1,404		1,855		
Chile		1,957					[3] 2,388	
Brazil [8]	September	[3 9] 34,271					[5] 40,000	
Uruguay		[5] 8,432					[3] 7,128	
Paraguay	Jan. 1 [6]	4,600					[5] 4,000	
Argentina	do [6]	[3] 37,065					[3 10] 32,212	
Estimated total [7]		101,500						
Europe:								
England and Wales	June	5,824	6,253	6,275	6,026	5,958	5,850	6,005
Scotland	do	1,171	1,198	1,210	1,214	1,233	1,233	1,209
Northern Ireland	do	748	667	697	738	700	673	681
Irish Free State	do	4,266	3,947	4,047	4,125	4,137	4,038	4,029
Norway [11]	do	1,128	1,200	1,209	1,221	1,224	1,251	1,310
Sweden	do	2,418		[3] 2,899			3,000	3,109
Denmark	July	2,613	2,838	2,913	3,016	3,036	3,057	3,208
Netherlands	(May–June)	[3] 2,063					[3] 2,366	
Belgium	Jan. 1 [6]	1,550	1,655	1,712	1,739	1,751	1,738	1,759
France	do [6]	13,582	14,373	14,482	14,941	15,005	15,631	15,467
Spain	do [6]	3,457	3,794	3,688		[3] 3,660	(3,657)	3,654
Portugal		797						
Italy [8]	(March–April)	6,812	[3] 7,400				[3] 7,029	
Switzerland	April	[3] 1,425	[3] 1,587					[3] 1,609
Germany	Jan. 1 [6]	16,786	17,202	17,221	18,011	18,414	18,033	18,470
Austria	(January [6]–April)	2,241					[3] 2,313	
Czechoslovakia	Jan. 1 [6]	4,377	4,690				[12] 4,540	4,459
Hungary	April	1,866	1,847	1,805	1,812	1,819	1,785	1,814
Yugoslavia [8]	January	4,122	3,738	3,760	3,686	3,765	(3,800)	3,850
Greece [8]	Jan. 1 [6]	742	890	964	947	955	874	881
Bulgaria [8]	do [6]	1,928		[3] 2,266				
Rumania [8]	do [6]	5,570	5,219	4,992	4,745	4,625	4,521	[13] 4,159
Poland	November	8,063		8,602		[3 10] 9,057	[3 10] 9,400	[3 10] 9,786
Lithuania	Jan. 1 [6]	1,149	1,396	1,128	1,199	1,199	1,160	1,170
Latvia	June	867	955	967	961	[5] 978	1,026	1,117
Estonia	July	508	599	634	651	604	627	669
Finland	September	1,847	1,860	1,872	1,917	1,903		
Russia, European and Asiatic.	Summer	58,263	63,274	68,158	69,759	66,377	52,095	
Estimated total, excluding Russia. [7]		98,000						
Africa:								
Abyssinia (Ethiopia)		(4,000)			4,000	4,000		
Morocco		1,711	1,933	1,865	1,814	2,151	2,092	
Algeria	September	853	946	849	887	897	938	872
Tunis	Jan. 1 [6]	459	370	468	501	484	498	502
French West Africa		2,165	2,329	2,402	2,529	[3] 2,844	2,825	
French Sudan		1,086	910	1,030	909	[3] 1,139	1,100	
Nigeria, including British Cameroons.		2,909	3,162	2,997	3,095	3,083	2,973	
French Cameroon		354				484	504	
Egypt [8]	September	1,310	1,485	1,497	1,580	1,623	1,572	
Anglo-Egyptian Sudan		864	1,500	1,501	1,503	1,505	1,300	
Italian-Somaliland	February	[3 9] 1,246			[3] 1,106	1,112	1,113	
Eritrea		553		748	[3] 749			
Kenya Colony	March–June	3,038	3,413	3,476	3,482	3,498	5,193	
Uganda	Jan. 1 [6]	1,109	1,342	1,338	1,733	1,710	1,911	1,985
French Equatorial Africa		815	881	[5] 881	[5] 884	[5] 885	[5] 886	
Belgian Congo		495	465	495	485	256	197	
Ruanda-Urundi		700	750	771	800	820	1,000	
Angola-Portuguese West Africa.		524	742	1,053	1,074	1,422		

See footnotes at end of table.

TABLE 309.—*Cattle: Number in countries having 150,000 or over, average 1921–1925, annual 1926–1931*—Continued

Country	Month of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
		Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Mozambique (Portuguese East Africa).		342	389	412	462	479	491	
British Southwest Africa		561	621	585	655	698	655	
Bechuanaland		482	518	598	625			
Union of South Africa	April–May	9,459	10,514	10,590	10,650	10,695	[14] 10,751	
Basutoland		604	645	659	650	664	649	
Rhodesia—								
Northern	Jan. 1 [6]	289	382	363	416	441	473	466
Southern	do [6]	1,794	2,102	2,189	2,327	2,326	2,398	2,468
Swaziland	do [6]	244	185	300	350	367	380	334
Tanganyika Territory		3,806	4,479	4,706	4,895	4,867	5,170	
Nyasaland	March	120				166	171	
Mozambique		342				479	491	
Madagascar	February	7,708		7,362	6,901	6,841	7,048	
Estimated total [7]		50,000						
Asia:								
Turkey, European and Asiatic [3].		4,821	5,572	5,772	5,559	5,215	5,343	
Persia		[5] 1,000						
Syria and Lebanon		257	243	312	318	332	391	
India—[8]								
British	December–April	*146,759*	*150,832*	*151,288*	*151,146*	*151,339*	[3] *154,629*	
Native States	do	33,982	33,276	34,643	33,409	33,671	[3] 47,104	
Ceylon [8]	January 1 [6]	1,459	1,457	1,537	1,588	1,618	1,650	1,660
China, including Turkestan and Manchuria.		[15] 22,000				24,000		
Japan	Jan. 1 [6]	1,440	1,460	1,465	1,474	1,484	1,488	1,498
Chosen	do [6]	1,567	1,591	1,595	1,586	1,570	1,586	1,612
Formosa [8]	do [6]	407	379	381	386	388	390	391
French Indo-China [8]		3,600	[16] 3,960	[16] 3,778	[16] 3,896	[16] 3,926	3,700	
Siam [8]	March	6,701	8,230	8,495	8,657	9,379	9,153	
Philippine Islands [8]	Jan. 1 [6]	2,393	2,622	2,846	2,958	3,011	3,110	3,249
Dutch East Indies—								
Java and Madura [8]	do [6]	5,287	5,721	5,680	5,781	5,658	5,700	5,768
Outer possessions [6]	do [6]	1,872	1,965	1,952	1,981	2,022	2,049	2,064
Estimated total, excluding Russia.[7]		235,300						
Oceania:								
Australia	Jan. 1 [6]	13,789	13,280	11,963	11,617	11,301	11,202	11,719
New Zealand	January	3,393	3,452	3,258	3,274	3,446	3,766	4,081
Estimated total [7]		17,400						
Total countries reporting, all periods, including Russia—								
To 1930 (58) [17]		464,634	473,127	478,368	479,703	479,246	486,187	
To 1931 (34) [17,18]		180,001	173,562	171,604	172,114	173,250	176,348	177,882
Estimated world total, including Russia [7,19].		648,400						

Bureau of Agricultural Economics. Compiled from official sources and the International Institute of Agriculture unless otherwise stated. Figures in parentheses interpolated.

[1] *Average for 5-year period if available; otherwise, for any year or years within this period except as otherwise stated.*
[2] Incomplete.
[3] Census.
[4] Year 1918.
[5] Unofficial.
[6] Countries reporting as of December have been considered as of Jan. 1 of the following year; i. e., figures for number of cattle in France as of Dec. 31, 1925, have been put in the 1926 column, etc.
[7] This total includes countries with less than 150,000, interpolations for a few countries not reporting each year and rough estimates for some others.
[8] Buffaloes included.
[9] Year *1920.*
[10] June.
[11] In rural communities only.
[12] Preliminary census figures for May 27.
[13] Estimate of total number based on number in rural communities only as compared with last year.
[14] Number in towns assumed to be same as in 1927; i. e., 177,000 and added in for purposes of comparison with preceding years.
[15] Estimate based on increase in 1920 in 20 provinces which supported 55 per cent of the cattle in China in 1914. No data available in 1920 for such important provinces as Hupeh, with 1,899,000 in 1914; Hunan with 2,192,000; Szechuan with 3,009,114; Kwantung with 2,288,000; and Kwangsi with 1,527,000.
[16] Including 1925 estimate of 1,324,500 cattle and buffaloes in order to compare with preceding estimates.
[17] Comparable totals for number of countries indicated.
[18] Excluding Russia as figures are not available for 1931.
[19] Estimated totals for continents are as follows in millions of head for the 5-year average 1926–1930: North America, Central America and West Indies, 80.5; South America, 101.0; Europe, excluding Russia, 103.8; Africa, 56.4; Asia, excluding Russia, 248.7; Oceania, 15.5; world, including Russia, 669.8.

TABLE 310.—*Cattle and calves: Receipts at principal public stockyards and at all public stockyards, 1923–1932*

CATTLE

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total 9 markets[1]	All other stockyards reporting	Total all stockyards reporting[2]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	3,157	561	1,041	947	2,632	1,086	608	839	714	12,183	4,816	16,999
1924	3,200	572	1,034	1,049	2,471	1,759	602	790	708	12,278	4,895	17,173
1925	3,023	627	1,038	1,060	2,409	1,593	609	995	845	12,098	5,019	17,117
1926	3,257	473	1,074	944	2,183	1,092	563	1,180	885	12,251	4,783	17,034
1927	2,872	577	1,004	956	2,070	1,463	641	955	747	11,186	5,072	16,258
1928	2,505	590	900	886	1,859	1,423	511	917	750	10,342	4,847	15,189
1929	2,388	550	832	762	1,836	1,444	500	879	778	9,974	4,363	14,337
1930	2,239	505	820	638	1,802	1,485	459	779	774	9,501	4,298	13,799
1931	2,287	440	702	508	1,665	1,570	433	811	769	9,364	4,122	13,486
1932	2,006	365	709	444	1,570	1,333	360	690	545	8,022	3,809	11,831

CALVES

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total 9 markets[1]	All other stockyards reporting	Total all stockyards reporting[2]
1923	761	59	358	311	576	108	101	510	45	2,829	3,383	6,212
1924	794	59	350	343	572	104	117	534	38	2,910	3,613	6,523
1925	848	60	406	310	549	116	125	641	52	3,108	3,842	6,950
1926	755	56	452	241	433	123	116	730	84	2,991	3,846	6,837
1927	710	63	444	330	400	98	99	627	62	2,834	3,671	6,505
1928	762	77	415	325	351	94	87	573	63	2,746	3,543	6,289
1929	672	68	391	327	342	102	89	546	61	2,601	3,502	6,103
1930	557	88	383	331	364	120	100	559	82	2,586	3,782	6,368
1931	547	64	379	243	292	120	76	603	82	2,406	3,723	6,129
1932	447	59	356	209	284	120	77	544	49	2,145	3,356	5,501

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the bureau. Receipts, 1900–1922, are available in 1924 Yearbook, p. 840, Table 435.

[1] Rounded totals of the complete figures.

TABLE 311.—*Cattle and calves: Receipts and stocker and feeder shipments at United States public stockyards, 1923–1932*

RECEIPTS, CATTLE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	1,395	1,038	1,044	1,159	1,305	1,138	1,357	1,622	1,782	2,141	1,650	1,368	16,999
1924	1,388	1,041	1,084	1,161	1,317	1,172	1,254	1,398	1,938	2,096	1,796	1,528	17,173
1925	1,353	1,056	1,273	1,201	1,139	1,160	1,398	1,632	1,592	2,126	1,717	1,470	17,117
1926	1,314	1,065	1,233	1,146	1,277	1,279	1,279	1,421	1,827	2,030	1,836	1,327	17,034
1927	1,327	1,080	1,172	1,107	1,348	1,185	1,089	1,494	1,482	2,008	1,749	1,217	16,258
1928	1,272	1,045	966	1,119	1,188	1,057	1,158	1,308	1,669	1,913	1,419	1,075	15,189
1929	1,100	814	953	1,146	1,097	977	1,166	1,156	1,572	1,787	1,405	1,104	14,337
1930	1,155	908	1,045	1,066	984	996	1,012	1,062	1,512	1,677	1,180	1,202	13,799
1931	1,040	878	1,017	1,057	1,027	1,017	1,035	1,302	1,279	1,531	1,312	991	13,486
1932	960	869	897	897	919	870	888	1,125	1,232	1,346	1,039	789	11,831

RECEIPTS, CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1923	482	389	458	511	595	492	546	592	512	661	532	442	6,212
1924	500	415	472	590	574	502	544	536	628	640	567	555	6,523
1925	516	473	588	626	597	586	572	612	566	663	505	586	6,950
1926	526	486	578	564	616	592	541	576	570	644	625	519	6,837
1927	504	476	571	567	607	547	457	571	507	627	598	473	6,505
1928	499	471	499	566	610	501	492	521	522	629	544	435	6,289
1929	479	381	497	606	563	475	499	463	531	620	538	451	6,103
1930	484	418	502	578	533	464	499	543	596	700	517	534	6,368
1931	468	426	518	560	524	522	453	519	518	606	554	462	6,129
1932	416	414	480	478	478	468	403	481	457	550	504	372	5,501

TABLE 311.—*Cattle and calves: Receipts and stocker and feeder shipments at United States public stockyards, 1923–1932*—Continued

STOCKER AND FEEDER SHIPMENTS, CATTLE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1923	202	199	186	221	286	220	212	459	608	734	577	338	4,304
1924	231	165	167	230	267	191	161	293	556	724	407	288	3,770
1925	194	163	213	254	198	143	234	347	409	681	449	308	3,593
1926	207	164	171	190	201	158	188	240	495	648	521	273	3,456
1927	187	162	182	184	215	157	128	252	364	626	548	278	3,303
1928	215	176	154	236	263	165	175	312	525	704	420	218	3,562
1929	159	106	146	266	266	157	159	246	394	673	459	219	3,250
1930	201	173	176	219	172	108	99	130	308	570	375	267	2,858
1931	180	130	126	156	135	100	108	231	348	495	384	207	2,609
1932	108	96	108	116	100	90	136	247	347	392	296	168	2,203

STOCKER AND FEEDER SHIPMENTS, CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1923	19	12	13	11	12	14	11	21	23	51	47	15	249
1924	*11*	*5*	*8*	*9*	*8*	*10*	*9*	*13*	24	39	*51*	21	208
1925	12	13	17	17	18	11	9	13	18	37	40	25	230
1926	18	13	13	13	17	11	11	12	26	45	49	28	256
1927	18	13	18	19	20	12	10	19	22	49	67	41	306
1928	16	19	19	18	21	19	21	24	37	94	76	35	403
1929	19	12	16	26	28	19	14	20	29	85	97	37	401
1930	32	28	30	36	28	21	10	20	75	121	103	64	568
1931	33	18	20	19	18	12	16	30	42	86	103	38	485
1932	22	14	18	22	18	15	21	33	43	86	81	42	416

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Earlier data in 1930 Yearbook, p. 829, Table 353.

TABLE 312.—*Feeder cattle, inspected: Shipments from public stockyards, 1923–1932*

Origin and destination	Calendar year									
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Market origin:										
Chicago, Ill	275	246	230	245	167	171	157	132	173	141
Denver, Colo	347	346	281	288	328	403	334	327	228	165
East St. Louis, Ill	170	136	113	110	97	90	99	86	95	103
Fort Worth, Tex	162	160	196	233	273	285	237	190	153	116
Indianapolis, Ind	59	49	55	44	29	31	27	27	25	24
Kansas City, Kans	1,138	901	825	706	671	684	680	650	635	595
Louisville, Ky	33	21	27	19	34	24	17	10	7	23
Oklahoma City, Okla	77	56	78	69	89	80	85	70	64	70
Omaha, Nebr	545	476	390	379	329	355	398	405	385	330
Sioux City, Iowa	281	249	247	300	237	274	286	282	229	171
South St. Joseph, Mo	97	85	71	56	51	60	61	90	88	73
South St. Paul, Minn	223	173	208	291	203	198	209	153	138	95
Wichita, Kans	198	193	200	152	198	205	164	217	173	116
All other inspected	194	185	177	195	268	344	326	312	301	290
Total	3,799	3,276	3,098	3,087	2,974	3,204	3,080	2,951	2,694	2,312
State destination:										
Colorado	159	166	131	169	180	210	184	156	113	80
Illinois	500	439	437	435	290	310	313	275	321	364
Indiana	149	137	150	167	136	113	106	94	132	133
Iowa	742	570	487	577	431	499	538	506	483	434
Kansas	511	473	468	378	423	478	463	454	351	271
Kentucky	49	25	41	43	86	59	46	24	27	34
Michigan	46	47	49	41	36	41	34	21	24	26
Minnesota	22	31	36	32	25	29	42	41	28	21
Missouri	418	285	277	265	267	229	203	192	218	186
Nebraska	648	565	427	374	386	474	447	561	419	264
Ohio	113	90	97	102	93	70	83	52	93	91
Oklahoma	115	108	168	159	170	143	155	128	103	97
Pennsylvania	27	24	31	30	31	70	44	37	39	57
South Dakota	70	57	38	32	50	64	75	91	45	26
Texas	95	128	116	151	160	196	155	123	98	71
Wisconsin	23	23	26	29	12	12	20	14	11	7
All other	112	108	119	113	198	207	172	182	189	150
Total [1]	3,799	3,276	3,098	3,087	2,974	3,204	3,080	2,951	2,694	2,312

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

[1] Includes 2 head shipped to Alaska in 1925 and 10 head in 1926.

TABLE 313.—*Beef cattle and veal calves: Estimated average price per 100 pounds received by producers in the United States, 1923–1932*

BEEF CATTLE

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	5.51	5.55	5.62	5.78	5.77	5.82	5.72	5.60	5.70	5.48	5.23	5.26	5.58
1924	5.33	5.41	5.58	5.77	5.91	5.76	5.63	5.65	5.51	5.44	5.40	5.32	5.55
1925	5.61	5.66	6.15	6.50	6.44	6.43	6.54	6.55	6.25	6.26	6.11	6.17	6.23
1926	6.29	6.39	6.62	6.64	6.55	6.55	6.43	6.27	6.46	6.40	6.29	6.37	6.43
1927	6.42	6.57	6.79	7.12	7.15	7.06	7.11	7.18	7.39	7.52	7.96	8.29	7.23
1928	8.45	8.70	8.81	8.88	9.03	9.07	9.16	9.45	9.93	9.62	9.21	8.90	9.12
1929	8.91	8.83	9.00	9.45	9.64	9.67	9.75	9.55	9.16	8.85	8.57	8.43	9.15
1930	8.66	8.63	8.72	8.60	8.32	8.14	7.06	6.22	6.58	6.50	6.39	6.33	7.46
1931	6.38	5.98	5.98	5.95	5.61	5.21	5.11	5.05	4.96	4.72	4.78	4.32	5.31
1932	4.29	4.08	4.25	4.19	3.91	3.81	4.52	4.35	4.31	3.91	3.73	3.41	4.07
VEAL CALVES													
1923	8.05	8.37	8.20	7.78	7.69	7.66	8.00	8.00	8.34	8.37	7.85	7.75	7.99
1924	8.35	8.50	8.41	8.31	8.12	7.90	7.87	7.93	8.08	8.21	7.89	7.83	8.11
1925	8.49	8.85	9.21	8.80	8.35	8.18	8.65	8.81	9.07	9.52	9.16	9.17	8.85
1926	9.43	9.85	9.74	9.45	8.92	9.65	9.47	9.54	10.06	10.29	9.54	9.44	9.61
1927	9.75	10.10	10.10	9.90	9.37	9.46	9.82	10.37	10.78	11.04	10.67	10.71	10.15
1928	10.87	11.30	11.33	11.18	11.17	11.55	11.86	12.28	13.03	12.61	11.99	11.81	11.72
1929	12.20	12.17	12.51	12.09	12.10	12.05	12.40	12.38	12.61	12.15	11.79	11.68	12.17
1930	11.84	11.69	11.24	10.73	9.68	9.83	9.19	8.78	9.20	9.30	8.84	8.48	9.91
1931	8.61	8.20	7.66	7.38	7.15	6.81	6.66	6.75	6.95	6.58	6.02	5.59	7.04
1932	5.62	5.80	5.69	5.04	4.67	4.63	5.00	4.93	5.12	4.75	4.47	4.16	5.00

Bureau of Agricultural Economics. Based on reports of special price reporters. Monthly prices of beef cattle, by States, weighted by number of cattle Jan. 1 to obtain a price for the United States; monthly prices of veal calves, by States, weighted by number of milk cows Jan. 1 to obtain a price for the United States; yearly price obtained by weighting monthly prices by receipts at principal markets.

TABLE 314.—*Cattle and calves: Average price per 100 pounds at Chicago, by months, beef steers and veal calves, 1923–1932*

BEEF STEERS [1]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	8.88	8.62	8.70	8.81	9.28	9.74	9.71	10.36	10.18	9.94	9.46	8.96	9.40
1924	8.99	8.81	9.17	9.52	9.59	9.28	9.31	9.53	9.52	9.57	8.90	8.71	9.24
1925	8.97	9.15	9.93	9.99	9.90	10.34	11.28	11.10	11.04	10.80	10.16	9.72	10.16
1926	9.48	9.42	9.42	9.11	9.07	9.51	9.44	9.30	10.00	10.00	9.48	9.43	9.47
1927	9.70	9.81	10.20	10.51	10.68	11.12	11.78	12.02	12.63	13.43	13.57	13.08	11.36
1928	13.67	13.15	12.83	13.01	13.19	13.86	15.11	15.30	15.91	14.61	13.84	12.86	13.91
1929	12.51	11.92	12.68	13.52	13.67	14.10	14.69	14.22	13.92	13.81	13.00	12.74	13.43
1930	12.62	12.46	12.33	11.88	11.15	10.59	9.42	9.48	10.95	10.64	10.47	10.17	10.95
1931	9.43	8.36	8.40	7.82	7.30	7.43	7.62	8.53	8.29	8.38	8.53	7.11	8.06
1932	6.61	6.21	6.31	6.35	6.04	6.66	7.90	7.88	7.91	7.09	6.29	5.44	6.70
VEAL CALVES													
1923	10.08	10.63	9.32	8.68	9.61	9.31	10.14	10.36	10.57	9.82	8.15	9.31	9.66
1924	11.08	10.54	9.75	9.03	9.30	8.74	9.48	10.63	10.72	10.10	9.02	9.97	9.86
1925	10.72	11.94	11.24	9.49	9.42	9.56	10.91	11.94	12.18	11.19	10.60	11.30	10.87
1926	12.18	12.43	12.06	9.91	11.04	11.09	11.38	12.46	12.59	11.80	11.09	11.31	11.61
1927	12.20	12.40	11.54	10.90	11.07	11.68	13.32	14.75	15.94	14.42	13.48	13.09	12.90
1928	13.70	15.04	13.75	13.02	13.95	13.24	14.84	16.68	17.36	14.94	14.22	13.94	14.56
1929	15.83	14.74	15.50	14.49	13.39	14.22	15.30	15.81	16.64	13.76	13.70	13.82	14.76
1930	14.80	12.66	11.96	10.55	11.36	11.03	11.37	11.98	11.63	11.33	9.53	9.77	11.51
1931	10.62	9.26	7.98	8.12	8.35	8.48	7.81	9.32	9.28	7.75	6.56	6.40	8.33
1932	7.56	7.52	6.41	5.44	5.70	6.06	6.10	6.80	7.06	5.48	5.09	5.26	6.21

Bureau of Agricultural Economics. Beef-steer prices are the weighted average price of all grades of beef steers sold out of first hands at Chicago. Veal-calf prices from the livestock and meat reporting service of the bureau on Medium to Choice grades prior to July 1, 1927, and subsequent prices on Good and Choice grades.

Earlier data in 1932 Yearbook p. 777.

See Crops and Markets for current prices of beef animals by classes, grades, and markets.

[1] Western steers not included.

TABLE 315.—*Cattle, choice steers for chilled beef: Average price per 100 pounds, by months at Buenos Aires, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	3.08	3.25	3.82	4.06	3.83	3.56	3.62	3.36	3.82	4.10	3.48	3.23	3.60
1924	3.19	3.40	3.61	3.50	3.56	3.76	4.51	4.93	5.15	5.95	5.62	5.42	4.38
1925	5.54	5.54	6.20	6.20	6.51	6.48	6.54	6.72	6.91	6.25	5.66	5.32	6.16
1926	5.40	5.42	5.27	5.39	5.52	5.24	5.58	5.70	5.45	4.63	4.06	4.21	5.16
1927	4.21	4.73	4.63	5.03	4.81	5.15	5.95	6.55	6.84	7.13	6.34	5.81	5.60
1928	6.11	5.86	6.21	6.33	6.65	6.99	6.79	6.60	6.67	6.38	5.61	5.32	6.29
1929	5.83	5.89	5.87	5.76	5.93	5.98	6.07	6.07	6.05	6.68	6.19	5.85	6.02
1930	5.80	5.35	5.39	5.74	5.57	5.44	5.27	5.27	5.22	4.91	4.52	3.76	5.19
1931	3.37	3.75	4.21	4.10	3.87	3.74	3.54	3.58	3.31	2.64	2.54	2.45	3.42
1932	------	2.32	2.18	2.17	2.17	2.28	2.29	2.32	2.45	1.80	1.69	1.58	------

Bureau of Agricultural Economics. Calculated from quotations in the Review of the River Plate. Prices prior to May, 1924, originally quoted on basis of price per head supplemented by price per pound of dressed carcass weight. Calculations assume average dressed weight of 730 pounds or live weight of 1,259 pounds. Live-weight quotations per pound from May, 1924. Converted at average monthly rate of exchange as given in Federal Reserve Bulletins.

TABLE 316.—*Cattle and calves: Annual slaughter under Federal inspection, 1907–1932, estimated equivalent of Federal inspection, 1880–1906, and estimated total slaughter (including farm) in United States, 1900–1932* [1]

[In thousands—i. e., 000 omitted]

Calendar year	Cattle		Calves		Calendar year	Cattle		Calves	
	Federally inspected	Total [2]	Federally inspected	Total [2]		Federally inspected	Total [2]	Federally inspected	Total [2]
1880	2,137	------	------	------	1907	7,633	13,287	2,024	6,211
1881	2,107	------	------	------	1908	7,279	12,852	1,958	6,048
1882	2,145	------	------	------	1909	7,714	13,611	2,189	6,516
1883	2,404	------	------	------	1910	7,808	13,541	2,238	6,553
1884	2,389	------	------	------	1911	7,619	12,958	2,184	6,284
1885	2,527	------	------	------	1912	7,253	11,979	2,278	6,348
1886	2,660	------	------	------	1913	6,978	11,478	1,902	5,285
1887	2,946	------	------	------	1914	6,757	11,004	1,697	4,661
1888	3,519	------	------	------	1915	7,153	10,822	1,819	4,640
1889	4,015	------	------	------	1916	8,310	12,027	2,367	5,774
1890	4,748	------	------	------	1917	10,350	13,724	3,143	7,031
1891	4,687	------	------	------	1918	11,829	15,750	3,456	7,514
1892	5,206	------	------	------	1919	10,091	14,638	3,969	8,445
1893	5,190	------	------	------	1920	8,609	13,885	4,058	8,455
1894	5,190	------	------	------	1921	7,608	12,271	3,808	7,771
1895	4,809	------	------	------	1922	8,678	13,148	4,182	8,363
1896	4,939	------	------	------	1923	9,163	13,883	4,500	8,824
1897	5,053	------	------	------	1924	9,593	14,400	4,935	9,466
1898	5,045	------	------	------	1925	9,853	14,706	5,353	10,099
1899	5,748	------	------	------	1926	10,180	14,971	5,153	9,542
1900	5,801	10,242	------	------	1927	9,520	14,000	4,876	9,030
1901	6,312	11,068	------	------	1928	8,467	12,452	4,680	8,667
1902	6,465	11,697	------	------	1929	8,324	12,241	4,489	8,318
1903	6,755	12,463	------	------	1930	8,170	12,168	4,595	8,532
1904	6,702	12,099	------	------	1931	8,108	12,156	4,717	8,792
1905	7,259	12,649	------	------	1932	7,625	------	4,494	------
1906	7,541	12,944	------	------					

Bureau of Animal Industry and Bureau of Agricultural Economics.

[1] Federal meat inspection act enacted in 1906. [2] Subject to revision.

TABLE 317.—*Cattle and calves: Shipments, slaughter, value of production, and income by States, 1931*

State and division	Shipments and local slaughter				Inshipments, stocker, feeding, breeding and dairy		Farm slaughter				Value of amount consumed on farms	Receipts from sales	Gross income	Value of production
	Cattle		Calves				Cattle		Calves					
	Head	Total weight	Head	Total weight	Head	Total weight	Head	Total weight	Head	Total weight				
	Thousands	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	34	27,580	51	5,400	1	800	3	2,100	7	875	35	1,934	1,969	1,976
New Hampshire	21	17,180	34	3,490	4	3,280	1	800	2	260	12	962	974	1,066
Vermont	45	37,190	151	15,250	9	7,380	6	4,200	9	1,215	81	2,729	2,810	3,088
Massachusetts	23	18,800	91	9,150	26	22,100	1	800	2	220	24	265	289	612
Rhode Island	6	4,980	10	1,000	4	3,320	1	800	1	120	17	81	98	218
Connecticut	25	20,650	62	6,450	11	9,130	1	750	1	130	17	957	974	1,384
New York	208	178,630	663	98,950	18	14,850	22	18,700	52	8,112	613	15,444	16,057	18,262
New Jersey	29	26,100	88	13,112	30	25,500	1	900	2	298	27	−46	−19	1,425
Pennsylvania	180	157,500	466	69,900	93	69,750	36	30,600	40	5,600	971	13,271	14,242	16,201
North Atlantic	571	488,510	1,616	222,702	196	156,110	72	59,650	116	16,830	1,797	35,597	37,394	44,254
Ohio	262	222,700	434	69,440	97	61,110	23	19,550	20	3,200	835	16,500	17,335	18,932
Indiana	292	262,800	326	48,900	135	91,125	20	15,500	15	3,750	719	15,825	16,544	16,540
Illinois	675	637,050	440	62,050	377	263,900	16	13,200	20	4,000	597	29,813	30,410	35,510
Michigan	211	174,075	352	54,560	31	18,600	23	18,400	50	8,000	642	14,080	14,722	15,182
Wisconsin	459	455,400	1,037	119,255	15	10,950	21	18,900	69	8,625	415	29,980	30,395	30,145
East North Central	1,899	1,752,025	2,589	354,205	655	445,685	103	85,550	174	27,575	3,208	106,198	109,406	118,309
Minnesota	661	572,007	689	88,468	164	109,880	30	25,200	38	8,360	1,277	30,604	31,881	35,250
Iowa	1,605	1,521,250	315	49,000	660	452,100	25	21,000	25	5,000	1,355	75,143	76,498	80,337
Missouri	843	757,680	387	77,400	383	243,205	10	7,650	10	3,000	335	36,883	37,218	41,284
North Dakota	301	251,335	82	11,480	3	2,100	22	17,160	27	5,400	800	11,719	12,519	14,117
South Dakota	597	513,420	95	21,850	63	42,210	12	10,320	14	4,200	677	27,920	28,597	26,906
Nebraska	1,472	1,358,625	115	33,000	664	464,800	20	16,800	22	6,600	1,253	63,402	64,655	58,257
Kansas	1,285	1,182,200	169	43,940	718	448,032	12	9,720	16	6,390	716	45,638	46,354	57,495
West North Central	6,764	6,156,417	1,852	325,138	2,655	1,762,327	131	107,850	154	38,950	6,413	291,309	297,722	313,648
North Central	8,663	7,908,442	4,441	679,343	3,310	2,208,012	234	193,400	328	66,525	9,621	397,507	407,128	431,957
Delaware	4	3,200	20	2,700	----	----	----	----	1	135	4	468	472	512
Maryland	34	28,900	114	15,390	14	9,800	3	2,550	4	540	68	2,521	2,589	2,690
Virginia	132	119,635	128	18,915	22	12,100	5	3,900	4	540	95	6,869	6,964	8,050
West Virginia	75	65,250	51	8,925	2	1,270	7	5,775	8	1,400	139	4,273	4,412	5,223

TABLE 317.—*Cattle and calves: Shipments, slaughter, value of production, and income by States, 1931*—Continued

State and division	Shipments and local slaughter				Inshipments, stocker, feeding, breeding and dairy		Farm slaughter				Value of amount consumed on farms	Receipts from sales	Gross income	Value of production
	Cattle		Calves				Cattle		Calves					
	Head	Total weight	Head	Total weight	Head	Total weight	Head	Total weight	Head	Total weight				
	Thousands	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
North Carolina	70	49,000	54	6,750			12	7,200	16	2,000	179	3,417	3,596	3,858
South Carolina	41	28,700	32	4,000	1	700	5	3,500	5	625	51	1,728	1,779	1,860
Georgia	106	47,700	68	10,880	7	3,150	12	5,400	45	7,875	166	2,977	3,143	3,281
Florida	38	18,050	43	4,945	2	1,400	8	3,800	6	690	47	1,395	1,442	1,556
South Atlantic	500	360,435	510	72,505	48	28,420	52	32,125	89	13,805	749	23,648	24,397	27,030
Kentucky	157	131,750	189	29,050	35	24,500	5	3,750	6	1,320	114	7,840	7,954	9,275
Tennessee	189	154,620	123	17,220	25	17,500	5	3,625	6	1,500	87	7,422	7,509	8,316
Alabama	105	55,125	70	10,500	4	1,600	7	3,150	9	1,575	64	2,550	2,614	3,225
Mississippi	176	105,600	59	8,850	7	3,500	6	3,240	8	1,280	51	3,804	3,855	4,329
Arkansas	92	58,350	40	7,000	3	1,500	7	3,430	10	2,100	69	2,653	2,722	4,146
Louisiana	121	72,600	38	5,320	16	5,600	12	5,640	10	1,800	164	3,586	3,750	4,578
Oklahoma	583	445,995	143	35,750	198	133,650	6	4,200	15	3,750	196	15,306	15,502	19,122
Texas	1,257	993,030	755	211,400	112	81,760	25	16,250	40	11,200	614	52,641	53,255	52,433
South Central	2,680	2,017,070	1,417	325,090	400	269,610	73	43,285	104	24,525	1,359	95,802	97,161	105,424
Montana	366	329,400	62	12,400	39	29,250	13	11,180	16	4,000	432	14,048	14,480	14,357
Idaho	133	119,700	31	5,580	20	14,000	8	6,000	15	2,400	127	5,558	5,685	6,709
Wyoming	210	171,310	21	6,665	20	13,000	6	4,950	2	660	200	7,573	7,773	8,651
Colorado	548	464,550	66	18,150	164	127,920	10	7,500	12	3,600	355	20,555	20,910	20,050
New Mexico	356	249,200	71	21,300	124	79,360	8	5,400	11	3,300	331	9,858	10,180	11,233
Arizona	205	139,380	44	11,880	71	49,132	4	2,608	4	1,000	132	4,962	5,094	6,338
Utah	86	80,700	21	4,200	7	5,250	6	5,100	10	2,000	200	4,325	4,525	4,811
Nevada	67	62,600	11	2,420	2	1,600	4	3,000	2	440	131	3,510	3,641	3,236
Washington	80	72,000	72	12,960	7	5,600	12	9,000	40	6,600	309	5,705	6,014	6,762
Oregon	118	114,460	67	13,400	3	2,250	12	9,360	35	5,250	230	8,240	8,470	9,204
California	548	513,720	380	90,000	164	126,772	20	17,600	30	6,300	806	29,253	30,059	25,326
Western	2,717	2,317,020	846	198,955	621	454,134	103	81,698	177	35,550	3,253	113,587	116,840	116,677
United States	15,131	13,091,477	8,830	1,498,595	4,575	3,116,286	534	410,158	814	157,235	16,779	666,141	682,920	725,342

Bureau of Agricultural Economics. Estimates Division Crop and Livestock Estimates and are preliminary. The figures on income as shown in Tables 451 and 452 are computed from the data shown in this table. The difference between gross income and value of production arises from the fact that in computing value of production allowance is made for changes in inventory numbers between the beginning and end of the year while in computing income these changes are not used.

TABLE 318.—*Cattle and calves: Slaughter in specified countries, 1923–1932*

Year	United States federally inspected	Canada, total	Argentina, including chilling, freezing, salting, and canned-meat works [1]	Uruguay, excluding farm [2]	Australia, total	New Zealand, total [3]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	13,663	1,850	3,338	1,393	2,049	485
1924	14,528	1,864	4,321	1,173	2,505	573
1925	15,206	1,921	3,871	1,233	2,434	850
1926	15,333	1,902	3,510	1,293	2,160	519
1927	14,396	1,993	3,723	1,239	2,189	636
1928	13,147	1,940	3,189	1,272	2,200	806
1929	12,813	1,953	3,024	1,375	1,947	811
1930	12,765	1,904	2,930	1,607	1,787	894
1931	12,825	1,702	2,453	1,102	(4)	[5] 959
1932 [5]	12,118	(6)	2,336	------	(4)	------

Bureau of Agricultural Economics. Compiled from official sources and cabled reports from agricultural representatives abroad.

[1] Including municipal and private slaughterhouses, the figures were as follows, in thousands: Average 1926–1930, 6,389. The numbers killed in freezing and chilling plants alone were as follows, in thousands: 1927, 3,224; 1928, 2,830; 1929, 2,792; 1930, 2,679; 1931, 2,297; 1932, 2,214.

[2] Slaughtering in freezing and chilling plants alone were as follows, in thousands: 1927, 695; 1928, 697; 1929, 853; 1930, 1,108; 1931, 901; 1932, 754.

[3] For years beginning Apr. 1.

[4] Slaughter for export only amounted to 397,168 head in 1932 compared with 425,000 in 1931 and 429,000 in 1930.

[5] Preliminary estimate.

[6] Inspected slaughter, only, was 937,000 in 1932 compared with 963,000 in 1931.

TABLE 319.—*Beef: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1923–1932*

Kind and year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Beef, frozen:												
1923	91,805	89,272	75,804	63,292	54,522	41,207	34,385	24,112	24,625	27,590	43,772	71,024
1924	82,984	79,944	76,769	68,075	52,941	41,784	37,028	29,435	29,135	28,599	45,857	70,731
1925	114,034	111,947	101,599	87,684	67,271	46,887	36,452	26,970	22,879	19,755	27,008	50,436
1926	59,850	55,705	51,498	43,528	32,372	26,649	23,997	23,509	21,311	25,267	38,079	59,603
1927	72,352	67,431	60,659	50,945	39,712	28,719	23,261	18,552	17,241	19,456	26,696	45,567
1928	54,968	50,673	44,017	37,625	28,253	20,654	17,256	18,896	17,603	22,463	41,635	60,189
1929	77,051	72,117	67,486	60,664	51,442	39,878	35,759	31,085	32,122	38,996	51,902	70,390
1930	77,230	72,692	69,800	64,146	57,273	49,913	46,819	45,830	42,433	43,515	47,221	54,894
1931	55,649	52,130	47,334	41,509	34,082	31,195	28,842	25,211	24,061	20,861	20,871	25,364
1932	39,812	36,147	35,663	31,377	26,837	22,429	17,856	14,976	12,943	14,139	23,324	27,843
Beef, cured and in process of cure:												
1923	24,450	24,841	24,987	25,210	24,013	23,816	22,835	21,781	21,416	20,597	19,649	22,142
1924	22,593	22,711	23,238	25,199	25,482	24,285	22,390	20,377	19,771	18,939	21,387	23,508
1925	28,930	28,758	29,210	28,634	28,952	27,731	25,102	22,704	22,335	20,964	20,473	23,128
1926	25,146	24,833	26,192	27,253	27,606	25,930	24,691	22,539	20,386	20,983	23,119	26,374
1927	28,521	27,823	27,361	28,214	23,216	21,694	20,495	17,170	16,205	16,422	17,220	19,778
1928	21,979	20,978	19,732	19,631	17,941	16,558	14,982	13,546	13,462	14,760	16,401	19,444
1929	21,862	21,873	21,285	20,943	19,272	17,437	16,296	14,845	15,892	17,438	20,157	23,054
1930	26,653	26,328	25,798	24,597	23,347	21,643	20,072	18,761	17,322	16,508	16,641	18,498
1931	19,636	20,268	20,288	19,602	19,068	18,253	16,706	15,844	14,989	14,310	13,536	13,794
1932	15,387	15,138	15,444	14,969	14,389	13,226	12,053	11,744	11,433	11,770	12,712	13,186

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

TABLE 320.—*Beef and beef products: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year: Average 1925–1929, Exports	Average 1925–1929, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931[1], Exports	1931[1], Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	1,552,601	93	1,234,142	63	1,114,480	66	1,115,653	112
Uruguay	287,281	0	220,814	0	300,392	0	----	----
Australia [2]	284,476	1,711	277,586	1,211	224,986	863	214,821	4,765
Netherlands	237,540	159,721	205,520	117,779	179,228	137,113	148,002	130,890
United States	144,303	84,233	126,442	146,749	117,985	63,872	100,891	29,433
New Zealand	*115,286*	*626*	*91,082*	*796*	*103,098*	*592*	*105,358*	*434*
Brazil	109,765	7,221	167,272	5,535	232,362	5,794	150,182	2,289
Canada	42,516	1,867	33,192	5,324	10,016	3,784	7,809	611
Denmark	27,793	12,359	14,613	11,142	54,113	9,539	77,568	10,583
Union of South Africa	23,193	8,935	25,950	9,158	30,585	6,311	22,240	13,831
Poland	17,646	2,032	12,918	1,521	23,457	1,904	21,520	1,049
Rumania	11,678	[3] 387	[4] 13,705	[4] 3	[4] 18,989	[4] 2	----	----
Irish Free State	8,992	8,581	9,515	4,518	6,061	4,275	2,973	725
China	5,071	1,619	3,050	1,865	3,061	1,815	591	1,491
Hungary	4,834	207	3,838	50	4,222	38	4,376	31
Total	2,872,975	289,592	2,439,639	305,714	2,423,035	235,968	1,972,044	196,242
PRINCIPAL IMPORTING COUNTRIES								
United Kingdom	34,345	1,795,364	23,446	1,638,697	29,176	1,640,993	40,863	1,607,824
Germany	4,267	386,911	8,656	253,740	21,478	193,629	9,948	74,976
France	35,552	147,055	39,806	56,477	37,723	99,058	33,995	156,341
Belgium	37,959	122,165	21,977	76,798	19,651	88,944	14,136	96,023
Japan	*0*	*68,201*	*0*	*68,059*	*0*	*69,888*	*0*	*74,426*
Cuba	267	44,490	258	43,418	0	31,030	----	----
Italy	335	23,611	324	16,833	251	21,620	466	17,431
Sweden	8,759	19,664	7,516	15,028	9,333	16,430	6,190	16,981
Spain	55	16,785	20	17,731	41	12,715	25	19,422
Norway	1,860	14,365	2,634	11,295	1,585	9,903	827	10,902
British India	1,254	11,346	1,247	10,969	978	11,243	775	13,723
Philippine Islands	0	11,013	0	10,849	0	6,446	0	7,202
Czechoslovakia	464	8,165	410	4,918	248	6,347	37	7,846
British Malaya	682	6,958	842	7,500	728	6,940	560	6,173
Switzerland	799	6,373	963	7,401	626	6,892	559	6,907
Finland	89	5,235	103	5,643	89	4,341	----	2,420
Egypt	11	4,767	10	5,986	0	2,969	0	2,218
Chile	125	3,645	175	2,711	146	1,948	109	----
Total	126,843	2,696,113	108,387	2,254,053	122,053	2,231,396	108,490	2,180,815

Bureau of Agricultural Economics. Official sources.

[1] Preliminary.
[2] Year ended June 30.
[3] 4-year average.
[4] International Yearbook of Agricultural Statistics.

TABLE 321.—*Cattle-tick eradication: Progress and status of the work December 5, 1932*

State	Quarantined counties on— July 1, 1906	Quarantined counties on— Dec. 5, 1932	Released counties to Dec. 5, 1932: Tick free	Released counties to Dec. 5, 1932: With 1 or more infested herds	Released counties to Dec. 5, 1932: Total counties released	Released counties tick free on Nov. 1— 1928	1929	1930	1931	1932
Alabama	67	0	67	0	67	59	63	64	67	67
Arkansas	75	0	60	15	75	45	45	53	55	60
California	*15*	*0*	*15*	*0*	*15*	*15*	*15*	*15*	*15*	*15*
Florida	67	18	46	3	49	22	30	33	41	46
Georgia	158	0	157	1	158	154	155	158	158	157
Kentucky	2	0	2	0	2	2	2	2	2	2
Louisiana	64	42	10	12	22	8	3	10	17	10
Mississippi	82	0	77	5	82	45	55	78	77	77
Missouri	4	0	4	0	4	4	4	4	4	4
North Carolina	73	0	73	0	73	73	73	70	73	73
Oklahoma	61	0	61	0	61	54	60	61	61	61
South Carolina	*46*	*0*	*46*	*0*	*46*	*46*	*46*	*46*	*46*	*46*
Tennessee	42	0	42	0	42	42	42	42	42	42
Texas	198	41	126	31	157	79	94	116	113	126
Virginia	31	0	31	0	31	29	30	31	30	31
Total	985	101	817	67	884	677	717	783	801	817

Bureau of Animal Industry.

TABLE 322.—*Hogs, including pigs: Estimated number on farms and value per head, by States January 1, 1931–1933*

State and division	Number			Value per head [1]		
	1931	1932	1933 [2]	1931	1932	1933
	Thousands	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*
Maine	52	53	55	12.90	8.70	7.00
New Hampshire	15	15	16	13.10	8.90	7.90
Vermont	29	32	34	12.00	7.60	5.60
Massachusetts	105	99	84	14.00	8.60	6.30
Rhode Island	5	5	5	15.40	8.00	6.80
Connecticut	26	25	25	15.50	9.20	6.90
New York	195	205	213	12.40	8.70	6.40
New Jersey	72	78	75	13.00	10.70	6.70
Pennsylvania	642	655	707	12.40	8.60	5.80
North Atlantic	1,141	1,167	1,214	12.69	8.60	6.10
Ohio	1,974	2,072	2,486	10.00	6.60	4.30
Indiana	2,637	2,953	3,573	10.70	6.90	4.60
Illinois	4,415	4,900	5,390	12.60	6.90	4.60
Michigan	542	661	773	10.50	6.90	4.60
Wisconsin	1,536	1,658	1,611	12.50	5.90	4.20
East North Central	11,104	12,244	13,833	11.57	6.71	4.48
Minnesota	3,665	3,884	3,490	13.10	6.30	4.60
Iowa	10,509	11,140	10,813	13.40	6.30	4.50
Missouri	3,488	4,100	4,390	8.90	5.70	3.80
North Dakota	766	751	623	12.40	5.40	3.70
South Dakota	3,000	2,040	2,142	13.40	5.40	4.10
Nebraska	4,820	5,334	4,374	13.40	5.90	4.30
Kansas	2,487	3,100	3,233	10.50	5.50	3.90
West North Central	28,735	30,358	29,071	12.54	5.98	4.22
North Central	39,839	42,602	42,904	12.27	6.19	4.31
Delaware	23	22	22	10.60	8.50	5.10
Maryland	168	160	176	9.50	7.50	4.90
Virginia	508	551	523	8.00	6.10	4.30
West Virginia	168	176	197	8.50	7.50	5.10
North Carolina	838	905	996	10.20	7.80	5.10
South Carolina	470	540	562	8.80	5.60	4.70
Georgia	1,299	1,390	1,376	8.40	5.00	3.40
Florida	498	508	513	6.10	3.70	2.70
South Atlantic	3,972	4,252	4,365	8.55	5.68	4.11
Kentucky	782	923	1,101	7.60	5.80	4.00
Tennessee	933	1,075	1,236	8.20	6.30	4.00
Alabama	870	957	1,053	7.90	5.40	4.20
Mississippi	764	878	1,010	7.00	5.30	3.50
Arkansas	627	909	1,100	6.70	5.80	3.50
Louisiana	605	679	672	7.30	6.50	4.10
Oklahoma	927	1,205	1,506	8.10	5.00	3.00
Texas	1,606	1,767	2,033	8.20	6.00	3.40
South Central	7,114	8,393	9,711	7.75	5.75	3.65
Montana	280	252	227	11.30	5.30	4.50
Idaho	270	324	308	10.90	5.00	3.40
Wyoming	137	123	98	10.80	5.40	3.40
Colorado	520	624	512	11.10	5.20	3.10
New Mexico	62	74	78	9.60	5.70	3.90
Arizona	21	23	24	10.30	5.90	4.10
Utah	77	85	87	9.70	5.20	3.90
Nevada	18	21	19	9.90	6.70	4.60
Washington	183	220	242	11.90	6.80	4.90
Oregon	205	246	221	11.10	6.20	3.90
California	560	672	706	11.10	6.30	4.30
Western	2,333	2,664	2,522	11.04	5.73	3.92
United States	*54,399*	*59,076*	*60,716*	*11.36*	*6.14*	*4.21*

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Sum of total value of subgroups (classified by age and sex), divided by total number and rounded to nearest dime for States. Division and United States averages not rounded. *State figures are new weighted value series not comparable to State figures previously published years prior to 1925.*

[2] Preliminary.

TABLE 323.—*Hogs: Estimated number on farms and value per head in the United States, January 1, 1900–1933*

Year	Hogs		Year	Hogs		Year	Hogs	
	Number [1]	Value per head Jan. 1 [2]		Number [1]	Value per head Jan. 1 [2]		Number [1]	Value per head Jan. 1 [2]
	Thousands	*Dollars*		*Thousands*	*Dollars*		*Thousands*	*Dollars*
1900 [3]	37,079		1911	55,700	9.90	1923	69,304	12.29
1900 [4]	*62,868*		1912	55,700	8.46	1924	66,576	10.30
1900	52,600	5.28	1913	54,000	10.42	1925 [4]	*50,854*	
1901	53,200	6.55	1914	51,800	10.99	1925	55,770	13.15
1902	46,800	7.43	1915	57,000	10.43	1926	52,085	15.66
1903	47,200	8.22	1916	59,700	8.88	1927	55,468	17.19
1904	49,500	6.50	1917	56,700	12.42	1928	61,772	13.17
1905	52,000	6.33	1918	61,200	20.65	1929	58,789	12.94
1906	54,600	6.53	1919	63,800	23.28	1930 [4]	*56,288*	
1907	57,300	8.05	1920 [4]	*59,346*		1930	55,301	18.46
1908	61,300	6.39	1920	60,159	20.00	1931	54,399	11.36
1909	57,000	6.92	1921	58,942	13.63	1932	59,078	6.14
1910 [4]	*58,186*		1922	59,849	10.58	1933 [5]	60,716	4.21
1910	49,300	9.69						

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Figures for 1900–1919 are tentative revised estimates of the Bureau of Agricultural Economics.
[2] Data for 1900–1925 are an old series for all hogs as reported, adjusted on basis average relationship between the new and the old series from 1926 to 1928. Old series was shown in 1928 Yearbook. Conversion factor was 1.057 (base was old series). Data for 1926–1933 are a new series, referred to above, of average values by age and sex classification weighted by numbers in each class.
[3] Original estimate of the Bureau of Agricultural Economics.
[4] Italic figures are from the census. Census dates were June 1, 1900; Apr. 15, 1910; Jan 1, 1920 and 1925; Apr. 1, 1930. 1900, 1910, and 1930 include spring-born pigs.
[5] Preliminary.

TABLE 324.—*Hogs: Numbers in countries having 150,000 and over, average 1921–1925, annual 1926–1931*

Country	Month of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
North America, Central America, and West Indies:		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
United States	January	62,088	52,085	55,468	61,772	58,789	55,301	54,399
Canada	June	4,344	4,360	4,695	4,497	4,382	4,000	4,717
Mexico	do	[3] 1,125	2,903				[3] 2,728	
Salvador		(330)					[3] 335	
Cuba		(591)					591	
Dominican Republic	May	866						
Haiti			170	185	200	220		
Estimated total [4]		73,000						
South America:								
Colombia		1,352	1,400	1,366			1,434	
Venezuela		512						
Ecuador		150				153		
Peru	February–April	429				[3] 689		
Bolivia		362	498	268		336		
Chile		255					[3] 331	
Brazil	September	[3] [5] 16,169						[6] 18,220
Uruguay		278					[3] 300	
Argentina	Jan. 1 [7]	[3] [8] 1,437					[3] [9] 3,769	
Estimated total [4]		21,000						
Europe:								
England and Wales	June	2,658	2,200	2,692	2,971	2,367	2,310	2,783
Scotland	do	167	145	197	196	142	143	162
Northern Irleand	do	134	159	236	229	192	216	236
Irish Free State	do	947	884	1,178	1,183	945	1,052	1,227
Norway [10]	do	216	303	300	283	289	339	317
Sweden [11]	do	1,056		1,369			1,522	1,614
Denmark	July	2,314	3,122	3,731	3,363	3,618	4,872	5,453
Netherlands	May–June	1,519					2,018	2,434
Belgium	Jan. 1 [7]	1,061	1,152	1,144	1,124	1,139	1,237	1,250
France	do. [7]	5,302	5,793	5,777	6,019	6,017	6,102	6,329
Spain	do. [7]	4,500	5,267	5,032		[3] 4,773		
Portugal		1,157						
Italy	March–April	2,630	[6] 2,850				[3] 3,265	
Switzerland	April	[3] 640	637					[3] 924
Germany	Jan. 1 [7]	15,776	16,200	19,424	22,899	20,106	19,944	23,442

See footnotes at end of table.

TABLE 324.—*Hogs: Numbers in countries having 150,000 and over, average 1921–1925, annual 1926–1931*—Continued

Country	Mouth of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
		Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Europe—Continued.								
Austria	Jan. 1 [7]	1,399					[2] 1,965	
Czechoslovakia	do.[7]	2,201	2,539				[3, 12] 3,088	2,776
Hungary	April and July	2,424	2,520	2,387	2,662	2,582	2,362	2,715
Yugoslavia	January	2,894	2,802	2,806	2,770	2,663	2,675	2,924
Greece	Jan. 1 [7]	390	452	510	453	419	[3] 276	335
Bulgaria	do.[7]	832		1,002				
Rumania	do.[7]	2,976	3,088	3,168	3,076	2,832	2,412	[6] 2,450
Poland	November	5,287		6,333		[9] 4,829	[9] 6,047	[9] 7,321
Lithuania	Spring	1,521	1,441	1,010	1,060	944	1,136	1,338
Latvia	June	465	521	535	535	[6] 382	523	712
Estonia	July	299	333	354	327	279	290	323
Finland	September	378	391	418	435	347		
Russia, European and Asiatic.[13]	Summer	21,184	21,027	23,202	25,989	20,384	13,332	
Estimated total, excluding Russia.[4]		61,300						
Africa:								
Union of South Africa	April–August	888	932	870	857	820	963	
Madagascar	February	369	386	335	328	412	531	
Estimated total [4]		2,200						
Asia:								
China (including Turkestan and Manchuria)		[14] 62,500						
Japan	Jan. 1 [7]	590	673	621	677	764	706	742
Chosen	do.[7]	1,078	1,150	1,221	1,244	1,277	1,328	1,387
Taiwan	do.[7]	1,302	1,435	1,543	1,643	1,718	1,754	1,750
French-Indo China		2,767	2,361	2,361	2,621	2,782	3,049	
Siam	March	864						
Straits Settlements		220						
Philippine Islands	Jan. 1 [7]	2,039	2,062	2,231	2,232	2,381		
Dutch East Indies—Outer possessions.	do.[7]	783		833				
Estimated total, excluding Russia.[4]		72,700						
Oceania:								
Australia	Jan. 1 [7]	918	1,128	989	878	910	1,018	1,072
New Zealand	January	396	473	520	587	557	488	476
Estimated total [4]		1,400						
Total countries reporting all periods, including Russia—								
To 1930 (27)[15]		135,488	127,125	137,274	150,243	137,711	128,359	
To 1931 (23)[15, 16]		110,280	102,419	110,506	120,448	113,313	110,484	116,523
Estimated world total, including Russia.[4, 17]		252,000						

Bureau of Agricultural Economics. Official estimates and International Institute of Agriculture unless *otherwise stated. Figures in parentheses are interpolated.*

1 Average for 5-year period if available, otherwise for any year or years within that period unless otherwise stated.

2 Incomplete.

3 Census.

4 This total includes countries with less than 150,000, interpolations for a few countries not reporting each year, and rough estimates for some others.

5 Year 1920.

6 Unofficial.

7 Estimates reported as of December have been considered as of Jan. 1 of the following year, i. e., the figure for the number of swine in France as of Dec. 31, 1925, has been put in the 1926 column.

8 Year 1922.

9 June.

10 Number in rural communities.

11 *Figures for* Sept. 15 are as follows: 1927, 1,387,000; 1930, 1,761,000; 1931, 1,724,000.

12 May.

13 Year 1916, from the Soviet Union Review, April, 1928, p. 52. Years 1924–26, Statistical Review, October, 1928; 1925 and 1926, Controlling Figures for National Economy of the *Union of Socialist Soviet* Republics, 1929–1930; year 1927, Agricultural Statistics of the Union of Socialist Soviet Republics, Lenin Academy, 1928–1930; *Statistical Abstract, Union of Socialist Soviet* Republics, 1932.

14 Estimates for all China based on official estimate for 1920 in 20 Provinces which supported over 50 per cent of the total in China in 1914.

15 Comparable totals for the number of countries indicated.

16 Excluding Russia.

17 Estimated totals for continents are as follows: *In millions of head for the 5-year average 1926–1930:* North America, Central America, and West Indies, 69.1; South America, 25.8; Europe, excluding Russia, 70.9; Africa, 2.4; Asia, excluding Russia, 73.3; Oceania, 1.6; world, including Russia, 264.0

TABLE 325.—*Hogs: Receipts at principal public stockyards and all public stockyards, 1923–1932*

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total 9 markets[1]	All other stockyards reporting	Total all stockyards reporting[1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	10, 460	495	4, 831	486	3, 615	3, 649	2, 457	3, 338	2, 989	32, 321	23, 009	55, 330
1924	10, 443	569	4, 580	392	2, 933	3, 978	2, 234	3, 751	3, 732	32, 613	22, 801	55, 414
1925	7, 996	467	3, 512	312	2, 067	3, 355	1, 073	3, 637	3, 396	26, 415	17, 514	43, 929
1926	7, 093	497	3, 536	217	2, 036	2, 647	1, 462	3, 451	2, 475	23, 413	16, 359	39, 772
1927	7, 724	457	3, 710	338	1, 904	2, 631	1, 425	3, 105	2, 322	23, 616	17, 795	41, 411
1928	8, 539	567	4, 036	432	2, 391	3, 179	1, 724	2, 902	2, 754	26, 525	20, 002	46, 527
1929	8, 193	539	3, 865	402	2, 476	3, 166	1, 627	2, 869	2, 313	25, 450	18, 647	44, 097
1930	7, 870	512	3, 459	279	2, 015	3, 363	1, 446	2, 759	2, 317	24, 021	16, 753	40, 774
1931	7, 942	597	2, 970	216	1, 337	3, 525	1, 322	3, 251	2, 646	23, 805	15, 733	39, 538
1932	6, 602	652	2, 626	255	1, 356	3, 078	1, 226	2, 600	1, 955	20, 251	14, 677	35, 028

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Receipts, 1900–1922 are available in 1924 Yearbook, p. 902, Table 500.

[1] Rounded totals of complete figures.

TABLE 326.—*Hogs: Receipts at United States public stockyards, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	5, 306	4, 492	4, 927	4, 318	4, 524	4, 204	4, 181	3, 714	3, 607	4, 616	5, 416	5, 825	55, 330
1924	6, 253	5, 335	4, 833	4, 374	4, 321	4, 296	4, 091	3, 197	3, 216	3, 990	4, 904	6, 604	55, 414
1925	6, 105	4, 558	3, 528	3, 247	3, 283	3, 507	2, 798	2, 549	2, 741	3, 390	3, 843	4, 380	43, 929
1926	4, 304	3, 372	3, 579	3, 135	3, 037	3, 143	2, 854	2, 804	2, 819	3, 261	3, 554	3, 910	39, 772
1927	4, 252	3, 308	3, 754	3, 142	3, 613	3, 775	3, 046	3, 042	2, 565	3, 039	3, 666	4, 209	41, 411
1928	5, 306	5, 287	4, 639	3, 483	3, 723	3, 548	2, 924	2, 523	2, 600	3, 666	4, 075	4, 773	46, 527
1929	5, 133	4, 000	3, 436	3, 582	3, 431	3, 275	3, 297	2, 904	3, 089	3, 701	3, 933	4, 256	44, 097
1930	4, 720	3, 781	3, 294	3, 255	3, 293	3, 215	2, 918	2, 617	2, 799	3, 441	3, 439	4, 002	40, 774
1931	4, 652	3, 704	3, 207	3, 067	2, 938	2, 854	2, 511	2, 454	2, 727	3, 402	3, 752	4, 210	39, 538
1932	4, 218	3, 650	2, 939	2, 960	3, 050	2, 545	2, 159	2, 405	2, 505	2, 601	2, 775	3, 123	35, 028

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Earlier data in 1930 Yearbook, p. 850, Table 376.

TABLE 327.—*Hogs: Monthly average live weight at Chicago, 1923–24 to 1932–33*

Crop Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Average Oct.–Mar.[1]	Apr.	May	June	July	Aug.	Sept.	Average Apr.–Sept.[1]
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
1923–24	247	234	231	227	229	237	234	239	239	241	251	255	254	246
1924–25	235	220	214	220	222	229	223	235	236	238	249	256	253	244
1925–26	242	228	225	231	235	245	234	244	247	256	271	281	267	261
1926–27	232	217	220	226	229	240	227	239	243	248	257	265	261	252
1927–28	235	215	217	225	230	235	226	233	234	239	251	257	251	244
1928–29	247	238	231	228	228	238	235	241	239	247	257	265	259	251
1929–30	242	223	224	228	231	235	230	234	238	245	257	255	244	246
1930–31	227	221	226	235	237	242	231	240	240	251	258	256	240	248
1931–32	222	217	223	230	233	237	227	238	239	245	260	263	260	251
1932–33	241	231	229											

Bureau of Agricultural Economics. Livestock and meat reporting service. Weighted average of packer and shipper purchases. Data for 1900–1923 are available in 1924 Yearbook, p. 909, Table 506.

[1] Simple average.

TABLE 328.—*Hogs: Estimated average price per 100 pounds received by producers in the United States, 1922–23 to 1932–33*

Year beginning October	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Weighted average
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1922–23	8.33	7.78	7.63	7.77	7.65	7.52	7.45	7.13	6.37	6.66	6.85	7.81	7.41
1923–24	7.23	6.66	6.39	6.59	6.54	6.63	6.70	6.68	6.55	6.60	8.54	8.50	6.85
1924–25	9.45	8.62	8.39	9.31	9.62	11.83	11.64	10.78	10.82	12.02	12.19	11.50	10.15
1925–26	11.16	10.66	10.51	10.99	11.76	11.65	11.49	11.97	12.80	12.69	11.66	12.07	11.55
1926–27	12.06	11.45	10.97	10.97	11.19	10.89	10.41	9.41	8.40	8.58	9.24	9.78	10.28
1927–28	10.16	8.09	8.14	7.80	7.61	7.48	7.75	8.82	8.70	9.64	10.01	11.17	8.50
1928–29	9.55	8.51	7.95	8.18	8.88	10.00	10.20	9.96	9.80	10.33	10.28	9.53	9.28
1929–30	9.10	8.54	8.53	8.80	9.48	9.57	9.17	8.99	9.10	8.38	8.51	9.44	8.96
1930–31	8.79	8.20	7.44	7.25	6.81	6.92	6.92	6.35	5.70	6.20	6.25	5.44	6.95
1931–32	4.70	4.36	3.76	3.76	3.53	3.90	3.58	2.96	2.82	4.23	4.06	3.78	3.78
1932–33	3.25	3.05	2.73										

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number of hogs Jan. 1, to obtain a price for the United States; yearly price obtained by weighting monthly prices by Federal inspected slaughter. For previous data see 1931 or earlier Yearbooks.

TABLE 329.—*Hogs: Average price per 100 pounds at Chicago, by months, 1923–1932*

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Simple average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923–24	7.42	6.85	6.87	7.10	7.06	7.35	7.36	7.34	7.04	7.68	9.38	9.57	7.58
1924–25	9.91	8.97	9.38	10.38	11.06	13.55	12.55	12.06	12.57	13.46	12.66	12.52	11.69
1925–26	11.31	11.28	10.97	12.02	12.45	12.20	12.33	13.55	14.01	12.51	11.48	12.03	12.18
1926–27	12.72	11.80	11.57	11.96	11.73	11.28	10.69	9.59	8.78	9.05	9.03	10.22	10.70
1927–28	10.39	8.92	8.32	8.25	8.08	8.08	9.28	9.67	9.91	10.65	11.53	11.89	9.58
1928–29	9.57	8.83	8.61	9.22	10.19	11.44	11.41	10.81	10.72	11.20	10.52	9.85	10.20
1929–30	9.38	9.06	9.34	9.78	10.67	10.17	10.00	10.02	9.52	8.73	9.58	9.70	9.67
1930–31	9.34	8.55	7.92	7.65	7.06	7.46	7.26	6.53	6.36	6.33	5.98	5.41	7.15
1931–32	5.09	4.61	4.20	4.00	3.89	4.33	3.85	3.34	3.62	4.58	4.21	4.00	4.14
1932–33	3.50	3.34	3.04										

Bureau of Agricultural Economics. Compiled from reports of packer and shipper purchases; such purchases do not include pigs, boars, stags, extremely rough sows, or cripples. The yearly figures are the simple average of the October to September prices. Data for 1901–1922 are available in 1932 Yearbook, p. 789, Table 336. See Crops and Markets for current prices of hogs by classes and grades.

TABLE 330.—*Swine: Annual slaughter under Federal inspection, 1907–1932, estimated equivalent of Federal inspection, 1880–1906, and estimated total slaughter (including farm) in United States, 1900–1932* [1]

[In thousands; i. e., 000 omitted]

Calendar year	Federally inspected	Total [2]	Calendar year	Federally inspected	Total [2]	Calendar year	Federally inspected	Total [2]
1880	16,353		1898	30,324		1916	43,084	67,613
1881	15,056		1899	28,697		1917	33,910	56,901
1882	13,158		1900	29,294	50,470	1918	41,214	64,796
1883	13,938		1901	31,129	51,870	1919	41,812	65,190
1884	14,089		1902	26,375	48,260	1920	38,010	61,890
1885	16,671		1903	26,971	47,900	1921	38,982	62,957
1886	17,428		1904	30,072	49,987	1922	43,114	68,105
1887	15,976		1905	31,855	51,540	1923	53,334	79,843
1888	15,609		1906	31,610	52,680	1924	52,873	79,631
1889	18,179		1907	32,885	54,058	1925	43,043	68,294
1890	23,557		1908	38,648	60,515	1926	40,636	65,779
1891	21,999		1909	31,395	53,220	1927	43,633	69,250
1892	20,519		1910	28,014	47,076	1928	49,795	76,593
1893	16,368		1911	34,133	56,646	1929	48,445	74,945
1894	21,270		1912	33,053	55,584	1930	44,266	70,390
1895	21,203		1913	34,199	57,046	1931	44,772	71,157
1896	22,228		1914	32,632	55,501	1932	45,245	
1897	26,065		1915	38,381	62,017			

Bureau of Animal Industry and Bureau of Agricultural Economics.

[1] Federal meat inspection act enacted in 1906. [2] Subject to revision.

TABLE 331.—*Hogs: Shipments, slaughter, value of production and income by States, 1931*

State and division	Shipments and local slaughter		Inshipments, stocker, feeding and breeding		Farm slaughter		Value of amount consumed on farms	Receipts from sales	Gross income	Value of production
	Head	Total weight	Head	Total weight	Head	Total weight				
	Thousands	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	13	3,380	1	100	26	7,020	261	564	825	708
New Hampshire	5	1,300	------	------	10	2,700	89	221	310	280
Vermont	10	2,600	------	------	25	6,500	214	495	709	658
Massachusetts	76	19,760	8	800	32	8,320	296	1,718	2,014	1,953
Rhode Island	2	500	------	------	5	1,250	48	99	147	133
Connecticut	9	2,340	1	100	20	5,200	214	432	646	580
New York	56	12,880	4	400	157	37,366	1,480	2,465	3,945	3,707
New Jersey	87	17,400	32	4,000	38	8,740	416	1,331	1,747	1,797
Pennsylvania	198	45,540	3	300	357	89,250	4,665	6,510	11,175	10,551
North Atlantic	456	105,700	49	5,700	670	166,346	7,683	13,835	21,518	20,457
Ohio	2,367	532,575	34	3,740	560	140,000	7,673	34,751	42,424	42,969
Indiana	3,207	737,610	30	3,600	500	125,000	7,208	46,160	53,368	55,861
Illinois	4,846	1,158,394	29	3,335	600	150,000	8,235	71,599	79,834	84,474
Michigan	525	107,625	23	2,300	255	61,200	2,466	8,222	10,688	11,301
Wisconsin	2,024	455,400	3	300	390	87,750	3,790	25,803	29,593	30,046
East North Central	12,969	2,991,604	119	13,275	2,305	563,950	29,372	186,535	215,907	224,651
Minnesota	5,362	1,179,640	126	13,860	395	86,900	4,036	63,599	67,635	67,424
Iowa	13,195	3,101,525	226	25,990	510	122,400	6,717	172,018	178,735	184,472
Missouri	3,678	827,550	44	4,840	620	155,000	8,181	48,697	56,878	61,142
North Dakota	1,096	252,080	------	------	240	57,600	2,306	11,388	13,694	12,649
South Dakota	3,945	907,350	7	805	170	39,950	2,011	48,173	50,184	44,650
Nebraska	6,037	1,509,250	14	1,400	330	84,150	4,489	83,092	87,581	88,374
Kansas	2,676	590,820	257	29,555	360	90,000	4,855	32,584	37,439	42,949
West North Central	35,989	8,368,215	674	76,450	2,625	636,000	32,595	459,551	492,146	501,660
North Central	48,958	11,359,819	793	89,725	4,930	1,199,950	61,967	646,086	708,053	726,311
Delaware	6	1,140	------	------	21	4,200	203	258	461	414
Maryland	40	6,400	------	------	148	35,520	2,071	1,093	3,164	2,977
Virginia	168	37,180	1	100	468	121,680	6,969	4,412	11,381	11,411
West Virginia	35	5,650	1	100	175	43,750	2,488	1,259	3,747	3,652
North Carolina	104	20,800	------	------	710	156,200	9,958	3,844	13,802	13,440
South Carolina	84	16,800	------	------	320	67,200	4,232	1,477	5,709	6,326
Georgia	368	55,200	------	------	760	163,400	8,383	4,356	12,739	13,148
Florida	180	26,350	------	------	270	37,800	1,247	2,531	3,778	3,672
South Atlantic	985	169,520	2	200	2,872	629,750	35,551	19,230	54,781	55,040
Kentucky	356	62,925	6	450	515	128,750	7,505	5,636	13,141	14,010
Tennessee	229	46,600	6	750	520	135,200	7,790	4,708	12,498	13,521
Alabama	60	11,160	1	150	510	102,000	5,351	1,802	7,153	7,577
Mississippi	70	10,500	2	280	450	90,000	4,871	2,060	6,931	7,525
Arkansas	64	9,600	1	100	386	77,200	3,735	1,625	5,360	6,879
Louisiana	176	26,400	3	450	280	44,800	2,214	2,251	4,465	4,934
Oklahoma	473	95,700	8	800	300	75,000	4,089	5,832	9,921	12,632
Texas	445	95,075	87	8,700	750	195,000	10,639	7,111	17,750	21,677
South Central	1,873	357,960	114	11,680	3,711	847,950	46,194	31,025	77,219	88,755
Montana	302	60,400	------	------	90	19,800	812	3,596	4,408	4,308
Idaho	286	54,340	2	200	65	15,275	762	3,298	4,060	4,737
Wyoming	119	22,610	1	100	30	6,900	317	1,349	1,666	1,529
Colorado	491	110,805	27	2,700	83	19,920	959	6,485	7,444	8,179
New Mexico	27	5,400	------	------	30	6,000	299	403	702	777
Arizona	27	5,400	------	------	8	1,520	66	424	490	489
Utah	38	5,700	------	------	34	6,800	321	484	805	947
Nevada	13	2,300	------	------	8	1,600	93	186	279	302
Washington	158	33,525	28	2,800	104	22,880	846	2,849	3,695	4,003
Oregon	170	33,700	17	1,700	100	21,000	805	2,782	3,587	3,986
California	581	105,450	6	600	62	12,400	625	7,647	8,272	9,205
Western	2,212	439,630	81	8,100	614	134,095	5,905	29,503	35,408	38,462
United States	54,484	12,432,629	1,039	115,405	12,797	2,978,091	157,300	739,679	896,979	929,025

Bureau of Agricultural Economics. Estimates Division of Crop and Livestock Estimates and are preliminary. The figures on income as shown in Tables 451 and 452 are computed from the data shown in this table. The *difference between gross income and value of production arises from the fact that in computing* value of production allowance is made for changes in inventory numbers at the beginning and end of the year, while in computing income these changes are not used.

TABLE 332.—*Hogs: Slaughter in specified countries, 1923–1932*

Year	United States, Federally inspected	Canada, total	Germany, inspected slaughter	Denmark, in export slaughterhouses	England and Wales, sold off farms for slaughter[1]	Scotland, sold off farms for slaughter[1]	Ireland, purchased by bacon curers	Netherlands, slaughter for consumption and export
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	53,334	6,056	5,830	3,414	3,691	245	951	1,785
1924	52,873	6,625	10,527	4,024	4,500	242	1,116	2,768
1925	43,043	5,720	12,090	3,766	3,588	----------	915	2,810
1926	40,636	5,636	13,072	3,838	3,074	----------	914	2,440
1927	43,633	5,965	17,279	5,098	3,080	----------	1,064	3,041
1928	49,795	5,880	19,480	5,373	4,109	----------	1,272	3,077
1929	48,445	5,747	17,252	4,994	3,244	----------	1,146	2,415
1930	44,206	5,248	18,041	6,132	3,214	----------	1,034	2,740
1931	44,772	6,187	20,520	7,320	3,838	----------	1,001	[3] 3,900
1932 [3]	45,244	([4])	18,948	[2] 7,500	([5])	([5])	[3] 1,121	[3] 3,900

Bureau of Agricultural Economics. Compiled from official sources and cabled reports from agricultural representatives abroad. *For earlier years see U. S. Department of Agriculture Yearbook 1931.*

[1] Years beginning Apr. 1.
[2] Estimates for year based on 6 months' total slaughter. The number of hogs slaughtered for bacon, mostly for export, is estimated at 1,464,000 head in 1932 compared with 1,499,000 in 1931. The decrease in slaughter for export in 1932 was practically balanced by increased home consumption.
[3] Preliminary estimates.
[4] Inspected slaughter alone was 2,723,000 head compared with 2,243,000 in 1931.
[5] Estimated slaughter in the United Kingdom and Irish Free State for year beginning Apr. 1, was as follows: 1923, 5,713; 1924, 6,285; 1925, 4,804; 1926, 4,439; 1927, 5,675; 1928, 6,168; 1929, 4,759; 1930, 4,858; 1931, 5,844.

TABLE 333.—*Lard, refined: Average price per 100 pounds at Chicago, by months, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	13.20	13.25	13.87	13.42	13.12	13.18	12.84	12.83	15.06	15.22	15.72	15.04	13.90
1924	14.52	13.03	12.84	12.50	12.19	12.13	13.65	15.94	16.25	18.05	16.68	18.00	14.65
1925	17.59	17.03	18.25	17.07	16.50	18.13	18.42	18.94	18.95	18.75	18.50	16.67	17.90
1926	16.81	16.44	16.70	16.75	17.13	18.48	18.00	17.38	17.50	16.75	15.75	15.25	16.91
1927	13.59	13.72	14.38	14.32	14.12	13.35	12.25	12.54	14.26	14.50	13.60	13.25	13.06
1928	12.50	11.60	11.50	12.50	13.10	13.50	14.00	14.70	15.25	14.40	13.62	12.88	13.30
1929	12.75	12.75	13.31	13.25	12.85	12.85	13.22	13.56	13.81	13.17	12.21	11.94	12.97
1930	11.45	12.38	12.12	11.65	11.50	11.00	10.50	12.44	14.25	13.94	12.31	10.70	12.02
1931	9.62	8.94	10.00	10.00	9.50	9.53	8.65	8.32	9.00	8.58	8.47	7.65	9.02
1932	6.50	6.53	6.70	6.00	5.50	5.33	6.96	7.00	6.75	6.25	6.19	5.28	6.25

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Beginning January, 1927, prices represent refined lard in hardwood tubs, earlier prices represent pure lard in tierces. Prices 1905 to December, 1922, available in 1927 Yearbook, p. 1018.

TABLE 334.—*Lard, American prime western steam: Average price per pound, in tierces, at Liverpool, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	13.3	13.0	13.7	13.6	12.9	13.0	12.7	12.7	14.0	14.5	15.7	15.1	13.7
1924	14.8	13.1	12.8	12.7	12.3	12.2	13.7	15.8	15.8	18.1	17.2	18.1	14.7
1925	18.0	[1] 17.5	18.7	17.8	17.6	19.1	19.3	19.2	19.2	17.9	17.8	16.6	18.2
1926	17.2	16.5	16.5	16.0	[1] 17.6	18.4	17.8	17.0	16.6	15.8	14.2	14.3	16.5
1927	14.3	14.4	14.4	14.3	14.1	14.4	14.3	13.8	14.6	14.4	14.0	13.5	14.2
1928	13.6	12.9	13.0	13.3	13.4	13.3	13.7	13.9	14.4	13.9	13.4	13.2	13.5
1929	13.4	13.5	13.9	13.5	13.4	13.5	13.9	13.6	13.5	12.7	12.1	11.8	13.2
1930	11.9	12.2	11.8	11.6	11.8	11.3	11.2	12.3	13.2	13.2	12.5	11.3	12.0
1931	------	9.8	10.5	10.3	9.5	10.0	9.5	8.8	8.7	9.0	8.2	7.3	[2] 9.2
1932	6.7	6.5	6.7	6.3	5.8	5.6	6.9	7.0	7.0	6.1	7.6	6.4	6.6

Bureau of Agricultural Economics. Compiled from Manchester Guardian. An average of Friday quotations. Converted at monthly average rate of exchange as given in Federal Reserve Bulletins to 1925, inclusive; subsequently at par of exchange, except that beginning with September, 1931, the conversions were at monthly average rates of exchange.

[1] 2 quotations only. [2] Average for 11 months.

TABLE 335.—*Lard and pork: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1923–1932* [1]

Product and year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Lard:												
1923	48, 808	56, 266	59, 101	66, 743	85, 251	84, 530	123, 896	143, 579	115, 860	72, 608	35, 225	35, 327
1924	49, 340	54, 130	68, 610	85, 722	102, 317	127, 949	152, 520	149, 672	124, 676	84, 198	31, 706	35, 713
1925	61, 049	112, 704	151, 927	150, 182	151, 499	138, 295	145, 919	145, 924	114, 724	71, 626	37, 256	33, 710
1926	42, 478	64, 187	76, 145	93, 108	98, 365	106, 824	120, 527	153, 572	151, 233	105, 558	72, 355	46, 744
1927	49, 992	69, 576	77, 103	92, 069	99, 611	111, 976	147, 318	179, 136	167, 018	118, 174	72, 121	46, 154
1928	54, 855	84, 007	121, 082	164, 506	173, 088	186, 073	214, 479	204, 939	177, 888	120, 890	83, 474	67, 257
1929	85, 217	140, 526	173, 864	179, 428	184, 748	183, 490	199, 699	203, 010	180, 085	153, 690	99, 845	68, 517
1930	82, 098	92, 171	111, 914	105, 067	104, 905	115, 270	120, 322	118, 353	88, 868	59, 732	36, 211	31, 582
1931	51, 434	62, 624	74, 977	78, 249	95, 693	103, 366	115, 561	121, 926	96, 047	69, 296	39, 766	34, 824
1932	51, 224	78, 430	92, 861	105, 635	111, 007	128, 103	130, 363	121, 618	100, 577	70, 656	34, 410	29, 766
Dry salt cured and in process of cure:												
1923	121, 125	155, 922	178, 024	206, 429	227, 728	214, 453	217, 862	221, 716	191, 711	146, 974	108, 850	110, 824
1924	148, 121	167, 507	178, 258	192, 934	191, 882	206, 009	212, 158	202, 618	180, 127	135, 702	81, 460	78, 871
1925	118, 718	136, 125	150, 819	142, 950	145, 548	142, 292	162, 518	164, 374	152, 555	128, 599	106, 011	96, 746
1926	119, 617	138, 005	144, 071	151, 286	140, 324	136, 801	148, 164	168, 882	172, 766	143, 572	98, 521	66, 765
1927	68, 203	86, 135	101, 156	124, 676	129, 637	143, 143	173, 256	185, 920	178, 107	140, 420	100, 922	77, 240
1928	97, 335	119, 751	160, 609	178, 012	173, 652	169, 663	174, 906	164, 473	156, 462	125, 899	101, 123	102, 440
1929	143, 011	167, 561	179, 776	178, 595	185, 580	171, 450	163, 805	172, 308	160, 519	139, 256	111, 092	88, 782
1930	107, 782	116, 288	123, 740	115, 653	110, 303	105, 913	108, 171	114, 095	97, 237	71, 143	43, 194	48, 931
1931	70, 188	108, 394	129, 278	141, 225	147, 995	148, 682	154, 949	168, 505	153, 507	116, 180	79, 453	63, 121
1932	87, 188	103, 827	122, 902	124, 242	127, 146	128, 423	118, 092	111, 210	108, 779	91, 355	65, 337	50, 674
Pickled,[2] cured, and in process of cure:												
1923	377, 107	412, 806	451, 279	469, 130	499, 119	483, 673	473, 569	449, 441	413, 798	367, 374	325, 456	384, 604
1924	434, 030	468, 892	500, 784	512, 190	500, 683	483, 372	473, 914	443, 918	408, 928	351, 485	283, 710	299, 868
1925	398, 521	443, 025	483, 302	468, 099	467, 395	425, 481	407, 610	373, 227	338, 156	284, 485	256, 684	261, 128
1926	294, 642	319, 726	345, 661	346, 049	338, 905	320, 305	333, 305	340, 687	330, 326	293, 106	257, 726	266, 222
1927	306, 904	352, 681	392, 642	420, 037	435, 967	432, 965	450, 172	440, 744	407, 239	341, 460	289, 553	276, 916
1928	320, 436	370, 916	461, 264	496, 322	480, 069	459, 878	454, 825	408, 994	351, 936	285, 309	265, 988	292, 626
1929	375, 217	424, 921	473, 916	453, 612	452, 868	443, 044	430, 317	412, 649	382, 750	342, 038	304, 400	316, 180
1930	368, 126	392, 123	443, 882	430, 926	411, 705	392, 403	396, 810	380, 182	329, 074	283, 979	249, 485	285, 636
1931	328, 010	402, 448	453, 042	431, 926	453, 038	434, 324	403, 908	362, 423	311, 985	277, 148	247, 986	264, 205
1932	334, 360	383, 273	445, 346	419, 687	430, 772	442, 222	411, 208	372, 787	349, 559	328, 309	308, 032	291, 177
Frozen:												
1923	72, 278	120, 196	154, 377	180, 115	213, 224	210, 645	217, 074	195, 002	148, 753	98, 795	71, 640	82, 068
1924	126, 718	164, 491	199, 044	227, 284	215, 767	201, 728	186, 566	164, 049	121, 816	77, 986	42, 561	48, 781
1925	130, 125	199, 642	231, 234	218, 508	201, 246	180, 645	168, 527	131, 935	93, 078	54, 294	29, 910	27, 153
1926	57, 960	98, 311	120, 115	129, 259	124, 569	117, 366	120, 707	133, 104	119, 994	77, 673	49, 376	55, 241
1927	97, 650	150, 255	177, 876	193, 733	204, 608	211, 742	220, 847	214, 607	181, 072	126, 887	76, 644	65, 666
1928	105, 654	164, 971	264, 043	323, 403	306, 951	289, 825	285, 628	245, 714	173, 617	103, 879	66, 049	66, 696
1929	151, 811	245, 798	291, 050	289, 754	285, 110	256, 291	247, 815	229, 397	176, 131	119, 204	75, 910	84, 667
1930	145, 078	178, 695	217, 942	206, 417	189, 692	176, 851	174, 240	157, 167	124, 648	92, 305	64, 127	77, 137
1931	122, 994	215, 422	271, 088	270, 520	266, 491	244, 745	215, 794	180, 883	129, 571	81, 559	53, 456	69, 237
1932	141, 758	187, 051	244, 151	248, 268	241, 146	225, 221	194, 971	159, 055	120, 538	78, 569	60, 179	61, 847

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

[1] Lard includes all prime steam, kettle-rendered, neutral, and other pure lards. It does not include lard substitutes nor compounds.

[2] Pickled pork includes sweet-pickled, plain-brine, and barreled pork.

TABLE 336.—*Pork and pork products: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year: Average, 1925–1929 Exports	Average, 1925–1929 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	1,136,856	10,459	1,208,089	8,515	949,730	4,655	750,822	3,978
Denmark	557,204	2,869	596,417	2,695	738,247	2,714	897,558	2,249
Netherlands	249,396	15,089	202,634	8,166	210,205	5,225	285,673	4,883
Irish Free State	92,656	55,011	95,774	50,579	78,353	54,153	88,293	57,050
Canada	90,757	17,247	40,462	21,982	20,651	21,308	22,209	5,318
Sweden	41,205	9,796	44,693	7,894	63,900	6,501	67,870	4,940
Poland	40,987	37,151	21,962	44,420	17,124	30,805	27,051	678
Hungary	26,512	84	14,074	3	26,205	1	12,026	0
New Zealand	13,177	35	19,768	5	16,848	2	13,612	6
China	12,824	413	12,019	343	10,586	278	9,742	----------
Argentina	9,319	42	13,456	32	12,403	31	14,116	16
Australia [2]	3,374	2,110	3,219	3,116	3,375	829	11,768	173
Total	2,274,327	150,315	2,272,587	147,749	2,147,775	126,682	2,200,800	79,783
PRINCIPAL IMPORTING COUNTRIES								
United Kingdom	5,883	1,371,607	5,432	1,396,908	5,102	1,490,935	6,110	1,702,810
Germany	4,584	322,127	6,159	275,581	13,735	237,707	11,655	266,135
Cuba	0	130,313	0	123,812	0	101,265	----------	----------
France	3,135	88,097	1,739	57,866	1,602	78,263	1,100	73,628
Czechoslovakia	4,018	81,017	4,802	84,792	3,459	64,227	2,070	63,347
Mexico	[3] *14*	*45,127*	----------	676	6	77,390	1	47,015
Austria	673	33,382	280	39,304	314	23,337	2,125	20,785
Belgium	7,184	22,099	3,910	35,593	3,006	34,804	2,580	41,596
Italy	3,212	16,850	1,277	28,812	2,059	11,055	2,679	3,463
Finland	*379*	*12,024*	*330*	*11,352*	*751*	*7,419*	*3,753*	*4,688*
Peru	6	11,692	10	9,464	0	4,906	3	----------
Norway	17	8,285	57	6,734	85	3,827	----------	2,026
Philippine Islands	0	7,015	0	8,203	0	6,810	0	8,176
Switzerland	*188*	*6,765*	*30*	*7,528*	*21*	*4,013*	*17*	*5,306*
Brazil	940	2,569	1,608	682	1,712	888	886	405
Spain	1,803	2,484	892	4,479	2,951	540	4,023	273
Union of South Africa	747	1,398	635	1,482	618	1,175	774	1,040
Chile	[3] *199*	*473*	*437*	*181*	*674*	*110*	*200*	----------
Total	32,982	2,163,324	27,598	2,093,449	36,185	2,149,631	37,958	2,241,362

Bureau of Agricultural Economics. Official sources except where otherwise noted. These figures comprise: Pork, fresh, canned, pickled, smoked, bacon, Cumberland sides, Wiltshire sides, hams and shoulders, lard, lard compound, neutral lard, hog casings, lard oil, heads, and feet.

[1] Preliminary. [2] Year ended June 30. [3] 4-year average.

TABLE 337.—*Bacon, Wiltshire sides,[1] green, firsts: Average price per pound at Bristol, England, 1923–1932*

Year	American	Danish	Irish	British	Year	American	Danish	Irish	British
	Cents	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*
1923	17.5	23.6	25.8	27.0	1928	17.9	21.2	23.7	25.8
1924	16.6	21.3	22.8	23.5	1929	[4] 21.9	24.5	26.6	28.3
1925	23.0	27.5	29.7	30.0	1930	19.3	20.8	25.1	27.6
1926	[2] 23.5	27.8	30.6	32.3	1931	13.9	13.1	18.7	19.5
1927	[3] 17.8	21.1	25.5	26.9	1932	[5] 8.1	9.2	------	13.6

Bureau of Agricultural Economics. Compiled from Agricultural Market Report, Ministry of Agriculture and Fisheries, Great Britain. Average for the last week of each month 1923. Average of weekly averages 1924–1932. Converted at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, inclusive; subsequently at par of exchange, except that beginning with September, 1931, the conversions were at monthly average rates of exchange. Prices of Canadian bacon are given for the years 1909–1925 in Table 393, 1931 Yearbook; these prices have not been quoted for later years by the Ministry of Agriculture and Fisheries.

[1] Entire half of hog in one piece, head off, back bone out, ribs in.
[2] Average for 11 months. [3] Average for 5 months. [4] Average for 9 months. [5] Average of 6 months.

TABLE 338.—*Lard: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	731,629	0	759,722	0	829,328	0	642,486	0	568,708	0
Netherlands	64,693	6,748	65,244	11,619	49,112	4,727	39,619	2,831	60,350	2,769
Denmark	25,954	1,383	30,851	1,315	28,434	1,259	38,102	1,377	50,613	912
China	10,672	0	8,229	0	9,880	0	8,458	0	7,912	0
Hungary	9,618	15	3,765	69	2,863	0	9,183	0	6,636	0
Canada	4,020	1,462	1,003	1,183	1,504	297	175	1,656	4,730	48
Irish Free State	3,852	699	4,491	625	3,794	879	3,210	1,016	6,655	2,193
Madagascar	1,998	2	2,140	6	1,353	1	1,514	0	0	1,689
Australia [2]	1,550	413	1,360	712	1,599	421	970	206	1,044	101
Total	853,986	10,722	876,825	15,529	927,867	7,584	743,717	7,086	706,648	7,712
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	912	267,191	950	272,469	524	292,681	739	279,444	645	284,505
Germany	857	216,643	[3] 890	192,956	[3] 483	212,780	[3] 267	177,180	[3] 428	183,454
Cuba	0	87,352	0	86,885	0	81,025	0	69,035	-------	-------
Czechoslovakia	52	66,159	12	60,248	2	66,499	7	52,630	4	45,402
Austria	672	33,151	403	30,839	280	39,036	25	22,334	1,970	18,493
France	500	32,856	359	29,278	465	28,302	493	17,414	304	5,771
Poland	47	30,326	109	44,601	32	35,143	22	26,549	139	577
Belgium	2,205	16,257	2,049	14,168	3,357	19,039	1,947	14,199	1,281	8,980
Peru	6	11,692	0	9,406	10	9,464	0	4,966	3	-------
Italy	820	7,523	156	11,652	298	11,902	256	5,324	211	2,807
Finland	54	6,758	0	7,837	0	6,284	0	5,277	0	3,302
Switzerland	21	6,031	14	5,638	13	6,783	10	3,908	14	3,345
Dominican Republic	0	4,883	*0*	*5,373*	*0*	*6,284*	*0*	4,058	0	4,549
Philippine Islands	0	4,799	0	4,896	0	5,859	0	4,706	0	5,909
British Malaya	1,151	3,832	1,346	4,084	824	3,526	815	2,399	426	1,978
Sweden	1,327	2,843	1,601	2,382	1,339	2,182	2,560	1,602	3,512	1,884
Brazil	231	2,312	45	335	856	372	986	654	653	310
Norway	*1*	*1,945*	*0*	*1,777*	*0*	*1,496*	*0*	*1,177*	0	*1,114*
Yugoslavia	936	1,501	88	677	15	3,280	262	201	1,748	16
Total	9,792	804,054	8,031	785,501	8,498	831,937	8,389	693,057	11,338	572,396

Bureau of Agricultural Economics. Official sources.

[1] Preliminary. [2] Year ended June 30. [3] Includes oleomargarine.

TABLE 339.—*Hogs: Cholera-control work by Bureau of Animal Industry, 1919–1932*

Year ended June 30	Bureau veterinarians engaged in work [1]	Premises investigated	Demonstrations		Autopsies performed	Outbreaks reported to bureau veterinarians
			Number	Hogs tested		
1919	180	93,512	-------	233,987	53,586	12,336
1920	140	46,145	3,037	347,702	10,963	9,788
1921	54	29,433	3,420	67,295	3,888	7,951
1922	80	47,137	4,343	88,846	5,390	7,920
1923	71	52,348	5,234	108,562	5,247	7,204
1924	45	29,443	3,178	78,007	3,686	7,225
1925	34	24,060	2,353	51,331	2,383	3,437
1926	35	20,599	2,579	69,230	2,446	4,558
1927	36.96	25,004	4,863	97,917	3,741	11,535
1928	38.42	25,156	4,444	106,906	3,368	6,941
1929	37.41	28,939	2,648	56,023	3,326	7,029
1930	36.5	26,858	1,740	35,158	2,505	4,162
1931	35.43	23,226	1,460	29,152	3,011	3,388
1932	34.53	24,792	2,066	36,552	3,722	6,480

Bureau of Animal Industry.

[1] Fractions in the number of veterinarians engaged denote part time devoted to hog-cholera-control work.

TABLE 340.—*Sheep and lambs: Estimated number on farms and value per head, by States, January 1, 1931–1933*

State and division	Number			Value per head [1]		
	1931	1932	1933 [2]	1931	1932	1933
	Thousands	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*
Maine	85	79	76	5.70	3.50	3.00
New Hampshire	19	18	17	6.20	4.50	3.70
Vermont	41	39	37	5.70	3.90	3.50
Massachusetts	11	11	11	7.30	4.50	3.60
Rhode Island	2	2	2	7.50	4.50	4.00
Connecticut	11	10	10	7.60	4.70	4.30
New York	489	473	459	6.20	4.40	3.60
New Jersey	8	7	7	7.50	5.40	3.60
Pennsylvania	481	491	501	5.90	4.40	3.00
North Atlantic	1,147	1,130	1,120	6.05	4.33	3.30
Ohio	2,000	2,120	2,120	4.00	3.50	2.80
Indiana	809	840	800	5.70	4.00	3.30
Illinois	725	749	699	5.90	3.80	3.10
Michigan	1,213	1,248	1,240	5.20	3.90	3.10
Wisconsin	543	540	454	5.30	3.20	2.90
East North Central	5,290	5,506	5,322	5.10	3.08	2.97
Minnesota	1,049	1,132	1,069	5.10	3.20	2.70
Iowa	1,313	1,428	1,190	5.50	3.30	2.90
Missouri	1,204	1,225	1,195	5.00	3.30	2.70
North Dakota	940	1,145	1,199	5.00	3.30	2.60
South Dakota	1,332	1,399	1,455	5.00	3.30	2.90
Nebraska	960	1,036	1,005	4.70	3.00	2.80
Kansas	609	777	591	4.50	3.10	2.70
West North Central	7,467	8,142	7,724	5.02	3.23	2.76
North Central	12,757	13,648	13,046	5.08	3.41	2.85
Delaware	4	4	4	7.00	5.00	3.80
Maryland	111	108	108	6.90	5.10	3.80
Virginia	495	495	495	6.70	4.60	3.50
West Virginia	625	631	631	5.90	4.40	3.30
North Carolina	90	91	92	5.80	3.90	3.10
South Carolina	14	14	14	4.60	3.70	3.10
Georgia	38	37	36	3.90	2.30	2.20
Florida	44	43	44	3.30	2.40	2.30
South Atlantic	1,421	1,423	1,424	6.11	4.37	3.32
Kentucky	915	942	942	6.50	4.70	3.90
Tennessee	382	393	405	5.80	4.00	3.20
Alabama	50	50	52	3.40	2.60	2.00
Mississippi	91	100	100	2.90	2.00	1.80
Arkansas	56	59	61	3.30	2.60	2.00
Louisiana	133	140	147	2.70	2.70	2.00
Oklahoma	183	185	201	4.60	3.00	2.70
Texas	6,834	7,212	7,644	4.20	2.90	2.50
South Central	8,644	9,081	9,562	4.48	3.12	2.61
Montana	4,244	3,820	4,049	5.10	3.20	3.00
Idaho	2,394	2,274	2,115	6.10	3.60	3.20
Wyoming	3,894	3,972	3,893	5.80	3.60	3.20
Colorado	3,351	3,391	3,055	5.60	3.10	2.90
New Mexico	2,780	3,002	2,820	4.90	2.30	2.30
Arizona	1,112	1,090	1,003	4.80	2.30	2.30
Utah	2,900	2,755	2,360	6.40	3.70	3.00
Nevada	1,175	1,152	890	6.30	4.00	3.40
Washington	735	706	720	6.20	4.00	3.30
Oregon	2,679	2,679	2,545	5.40	3.50	2.90
California	3,366	3,198	3,038	6.30	4.20	3.30
Western	28,630	28,039	26,488	5.68	3.39	2.98
United States	52,599	53,321	51,630	5.36	3.40	2.90

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Sum of total value of classes divided by total number and rounded to nearest dime for States. Division and United States averages not rounded.
[2] Preliminary.

TABLE 341.—*Sheep: Number in countries having 100,000 and over, average 1921–1925, annual 1926–1931*

Country	Month of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
North America, Central America, and West Indies:		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
United States	Jan. 1	37,662	40,183	42,302	45,121	48,249	51,383	52,599
Canada	June	3,027	3,142	3,263	3,416	3,636	3,696	3,606
Mexico	do	1,362	2,698				[2] 1,574	
Guatemala		153	148	216	241	189	184	
Cuba						102		
Dominican Republic		148						
Estimated total [3]		42,700						
South America:								
Colombia		776	800	771			810	
Venezuela		113						
Ecuador		(1,000)	700			[4] 1,500		
Peru		11,363				[2] 11,209		
Bolivia	Jan. 1 [5]	3,436	4,200	4,151		5,552		
Chile		4,332	[6] 4,094				[2] 6,263	
Brazil	September	[2,7] 7,933						
Uruguay		[2] 14,443				[4] 19,358	[2] 20,558	
Paraguay	Jan. 1 [5]	(600)						
Argentina	do.[5]	[2] 36,209					[2,6] 44,413	
Falkland Islands		649	606	607	631	613	607	
Estimated total [3]		80,900						
Europe:								
Iceland		565	590	600	627	640		
England and Wales	June	14,385	16,859	17,072	16,390	16,105	16,316	17,749
Scotland	do	6,827	7,203	7,536	7,579	7,556	7,650	7,831
Northern Ireland	do	456	529	600	624	654	704	794
Irish Free State	do	2,804	3,003	3,120	3,264	3,375	3,515	3,575
Norway [9]	do	1,380	1,595	1,608	1,654	1,533	1,588	1,692
Sweden	June–September	1,384		708	806	(700)	652	635
Denmark	July	380	233			193		
Faroe Islands		66						
Netherlands	May–June	668					[2] 485	
Belgium	Jan. 1 [5]	126			[4] 122			
France	do.[5]	9,777	10,537	10,775	10,693	10,445	10,452	10,152
Spain	do.[5]	19,229	20,067	20,529		[2] 19,370	19,530	20,047
Portugal		3,721		[4] 4,450	[4] 4,900	[4] 4,000		
Italy	March–April	12,014	[4] 12,350	[4] 12,500			[2] 10,043	
Switzerland	April	245	169					184
Germany	Jan. 1 [5]	5,889	4,753	4,080	3,819	3,635	3,480	3,504
Austria	do.[5]	526					[2] 272	
Czechoslovakia	do.[5]	[2,7] 986	861				[2,10] 836	608
Hungary	April	1,661	1,804	1,611	1,566	1,573	1,464	1,440
Yugoslavia	January	7,728	7,907	7,933	7,736	7,722	7,736	7,953
Greece	Jan. 1 [5]	5,965	6,636	6,951	6,442	6,920	5,806	6,799
Bulgaria	do.[5]	8,186		[2] 8,739	8,427	7,986		
Rumania	do.[5]	11,660	12,950	13,582	12,941	12,801	12,406	12,230
Poland	November	2,193		1,918		2,523	2,492	2,599
Lithuania [11]		1,314	1,573	1,410	1,468	1,125	1,097	1,212
Latvia	June	1,240	1,153	1,128	1,090	906	873	923
Estonia	July	654	666	667	659	476	467	479
Finland	September	1,526	1,414	1,368	1,319	1,414		
Russia (European and Asiatic).[12]	Summer	93,569	113,865	126,835	133,500	132,700	111,600	
Estimated total excluding Russia.[3]		123,600						
Africa:								
Abyssinia (Ethiopia)		(2,000)				4,000		
Morocco		7,533	9,250	7,712	8,035	8,848	7,357	
Algeria	September	5,943	6,786	5,083	5,614	6,196	7,172	4,671
Libia (Italian)		1,043			822			
Tunis	Jan. 1 [5]	1,794	1,329	2,142	2,142	2,173	2,461	2,976
French West Africa		3,742	4,365	3,968	5,341	5,113	7,458	
French Sudan		2,173		2,400	2,424	2,739	3,000	
Gold Coast		373	325	350	400	400		
Nigeria including British Cameroons.		1,711	1,809	1,827	1,785	2,121	2,478	
Egypt	September	1,013	1,144	1,232	1,180	1,003	1,129	
Anglo-Egyptian Sudan		1,638	2,000	2,201	2,201	2,200	2,200	
British Somaliland		(2,000)	2,000	2,000	1,300	1,700	2,000	
Italian Somaliland	March 31	1,666			[2] 1,039	855	847	
Eritrea (Italian) [11]		1,701		1,842	[2] 1,897			

See footnotes at end of table.

TABLE 341.—*Sheep: Number in countries having 100,000 and over, average 1921–1925, annual 1926–1931*—Continued

Country	Month of estimate	Average, 1921–1925 [1]	1926	1927	1928	1929	1930	1931
		Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Africa—Continued.								
Kenya Colony	March–June	2,600	2,756	2,805	2,847	2,905	3,228	
French Cameroon [11]		287	410	456	441	620	664	
Uganda	Jan. 1 [5]	386	604	866	911	967	806	792
Belgian Congo		304	300	285	270	348	369	
Ruanda Urundi		150	125	125	110	125		
British Southwest Africa		954	1,069	1,252	1,524	1,497	1,601	
Bechuanaland		125	132	152	152			
Union of South Africa	*August*	*32,561*	*39,020*	*40,271*	*42,662*	*45,172*	*48,520*	[13] *51,300*
Basutoland		1,954	2,100	2,149	2,100	2,150	2,400	
Rhodesia, Southern	Jan. 1 [5]	333	349	332	352	359	354	360
Tanganyika Territory [11]		*3,893*	*4,462*	*4,779*	*5,062*	*5,041*	*5,522*	
Madagascar		110	116	66	142	201	263	
Estimated total [3]		78,500						
Asia:								
Arabia		(3,500)		[4] 3,500				
Cyprus	March	237	207	260	264	273	290	306
Turkey, European and Asiatic.		10,458	12,872	13,632	12,079	10,184	10,498	11,762
Iraq (Mesopotamia) [11]	*February*	5,270	5,055	6,136	5,619	6,136	7,153	
Palestine	March	271	291	243	227	232	253	
Persia		16,562	16,562	[4] 14,280	[4] 15,000	[4] 16,000		
Syria and Lebanon		1,797	1,400	1,404	2,149	2,540	2,682	
India, British	December–April	22,412	23,201	23,237	23,360	23,336	[8] 26,540	
Native States	do	12,299	11,848	12,353	12,156	12,445	19,089	
China		[14] 28,700				[15] 35,000		
Philippines	Jan. 1 [5]	260	344	369	368	360	125	128
Dutch East Indies:								
Java and Madura	do.[5]	915		1,292				
Outer possessions	do.[5]	115		121				
Estimated total exclusive of Russia.[3]		114,100						
Oceania:								
Australia	Jan. 1 [5]	85,556	103,563	104,267	100,827	103,431	104,558	110,568
New Zealand	April	23,382	24,906	25,649	27,134	29,051	30,841	29,793
Estimated total [3]		109,000						
Total countries reporting, all periods, including Russia—								
To 1930 (47) [16]		456,727	518,734	538,801	546,916	556,185	557,565	
To 1931 (27) [17]		292,568	330,539	337,038	336,815	344,247	353,788	365,243
Estimated world total, including Russia [3] [18]		642,400						

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture unless otherwise stated. Figures in parentheses are interpolated.

[1] Average for 5-year period if available, otherwise for any year or years within this period except as otherwise stated.
[2] Census.
[3] This total includes countries with less than 100,000, interpolations for a few countries not reporting each year, and rough estimates for some others.
[4] Unofficial.
[5] Countries reporting as of Dec. 31 are considered as of Jan. 1 of the following year; i. e., figures for number of sheep in France as of Dec. 31, 1925, have been placed in 1926 column.
[6] Year 1925.
[7] Year 1920.
[8] June, 1930.
[9] In rural communities only.
[10] May.
[11] Goats included.
[12] Years 1924–1926. Statistical Review, October, 1928, p. 6. Year 1927. Agricultural Statistics of the Union of Socialist Soviet Republics, Lenin Academy, 1928–1930. Statistical Abstract Union of Socialist Soviet Republics, 1932.
[13] Estimate based on increase reported in June, compared with preceding June.
[14] Estimate based on increase in 1920 in Provinces which supported 80 per cent of total in China in 1914.
[15] Average of range from 25,000,000 to 45,000,000.
[16] Comparable totals for number of countries indicated.
[17] Excluding Russia.
[18] Comparable estimated world total for 5-year average 1926–1930 in millions of head is 751.3; i. e., North America, Central America, and West Indies 52.3; South America, 98.3; Europe, excluding Russia, 125.5; Africa, 97.3; Asia, excluding Russia, 123.3; Oceania, 130.9.

TABLE 342.—*Sheep and lambs: Estimated number on farms and value per head, United States, January 1, 1900–1933*

Year	Sheep		Year	Sheep		Year	Sheep	
	Number [1]	Value per head Jan. 1		Number [1]	Value per head Jan. 1		Number [1]	Value per head Jan. 1
	Thousands	*Dollars*		*Thousands*	*Dollars*		*Thousands*	*Dollars*
1900 [2]	41,883		1911	47,349	3.91	1924	37,020	7.68
1900 [3]	*61,504*		1912	43,279	3.46	1925 [3]	*35,590*	
1900	44,573	2.93	1913	40,700	3.94	1925	38,392	9.68
1901	46,155	2.98	1914	37,773	4.02	1926	40,183	10.48
1902	46,667	2.65	1915	36,287	4.50	1927	42,302	9.67
1903	45,180	2.63	1916	36,543	5.17	1928	45,121	10.22
1904	42,439	2.59	1917	36,700	7.13	1929	48,249	10.59
1905	40,268	2.82	1918	39,000	11.82	1930 [3]	*56,975*	
1906	42,454	3.54	1919	41,000	11.63	1930	51,233	8.94
1907	44,518	3.84	1920 [3]	*35,034*		1931	52,599	5.36
1908	46,557	3.88	1920	40,643	10.45	1932	53,321	3.40
1909	48,382	3.43	1921	39,378	6.27	1933 [4]	51,630	2.90
1910 [3]	*52,448*		1922	36,821	4.79			
1910	47,072	4.12	1923	36,695	7.49			

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Figures for 1900–1910 are tentative revised estimates of the Bureau of Agricultural Economics.
[2] Original estimate of the Bureau of Agricultural Economics.
[3] Italic figures are from the census. Census dates were June 1, 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925; and Apr. 1, 1930. 1900, 1910, and 1930 include spring-born lambs.
[4] Preliminary.

TABLE 343.—*Sheep: Receipts at principal public stockyards and at all public stockyards, 1923–1932*

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total nine markets [1]	All other stockyards reporting	Total all stockyards reporting [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	4,098	1,857	561	386	1,671	2,970	979	454	216	13,191	8,834	22,025
1924	4,192	2,040	480	373	1,569	2,844	1,089	476	310	13,381	8,820	22,201
1925	3,969	2,357	559	314	1,500	2,420	1,143	545	360	13,166	8,934	22,100
1926	4,405	1,826	636	445	1,762	2,780	1,303	773	449	14,378	9,490	23,868
1927	3,829	1,908	574	445	1,616	2,604	1,348	705	527	13,555	10,384	23,939
1928	3,868	2,295	510	458	1,767	3,037	1,580	891	568	14,974	10,623	25,597
1929	3,785	2,290	534	540	1,753	3,031	1,636	1,139	640	15,548	11,320	26,868
1930	4,335	2,062	584	432	2,016	3,410	1,634	1,354	1,188	17,015	12,793	29,808
1931	4,489	2,499	661	1,173	2,244	3,510	1,572	1,600	1,279	19,118	13,905	33,023
1932	3,922	2,834	711	1,198	1,837	2,388	1,291	1,522	776	16,479	12,827	29,306

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the bureau. Receipts, 1900–1922, are available in 1924 Yearbook, p. 933, Table 540.

[1] Rounded totals of complete figures.

TABLE 344.—*Farm prices of sheep, per head, by ages, United States, January 1, 1924–1933*

Jan. 1	Under 1 year old	Ewes 1 year and over	Wethers 1 year and over	Rams	Jan. 1	Under 1 year old	Ewes 1 year and over	Wethers 1 year and over	Rams
	Dollars	*Dollars*	*Dollars*	*Dollars*		*Dollars*	*Dollars*	*Dollars*	*Dollars*
1924	6.97	8.10	5.98	15.55	1929	8.93	11.19	7.64	20.27
1925	8.53	10.02	7.13	16.91	1930	7.85	9.10	6.44	19.63
1926	9.04	11.01	7.32	18.45	1931	4.64	5.42	3.43	12.91
1927	7.91	10.32	6.60	18.73	1932	2.67	3.47	2.38	8.20
1928	8.45	10.86	7.23	19.63	1933	2.66	2.87	1.79	6.86

Bureau of Agricultural Economics. Based on returns from special price reporters. Average price, by States, weighted by estimated numbers each age group.

TABLE 345.—*Sheep: Receipts and stocker and feeder shipments at United States public stockyards, 1923–1932*

RECEIPTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	1,636	1,366	1,430	1,447	1,794	1,426	1,661	1,800	2,659	3,464	1,818	1,526	22,025
1924	1,697	1,412	1,307	1,348	1,344	1,550	1,672	2,005	3,027	3,295	1,879	1,665	22,201
1925	1,467	1,388	1,504	1,541	1,689	1,603	1,699	2,064	2,627	3,198	1,712	1,608	22,100
1926	1,548	1,480	1,694	1,502	1,717	1,913	1,739	2,277	3,279	3,090	1,917	1,706	23,668
1927	1,740	1,501	1,558	1,486	2,013	1,816	1,676	2,209	2,846	3,587	1,896	1,609	23,939
1928	1,705	1,669	1,520	1,591	1,952	1,913	1,898	2,362	3,386	3,938	2,053	1,610	25,597
1929	1,877	1,544	1,527	2,012	2,173	1,752	2,119	2,545	3,355	4,093	2,168	1,703	26,868
1930	1,903	1,803	2,151	2,230	2,334	2,230	2,290	2,583	3,580	3,784	2,607	2,307	29,806
1931	2,175	1,964	2,120	2,713	2,810	2,587	2,535	3,270	3,900	3,956	2,811	2,182	33,023
1932	2,363	2,035	2,115	2,412	2,429	2,428	2,240	2,919	3,210	3,200	2,203	1,657	29,306

STOCKER AND FEEDER SHIPMENTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1923	171	169	114	82	216	117	188	341	897	1,489	540	154	4,478
1924	149	106	83	105	118	152	226	444	973	1,438	676	206	4,070
1925	138	119	94	100	178	137	193	421	857	1,392	475	219	4,332
1926	155	107	83	124	130	238	260	567	1,093	1,150	493	223	4,623
1927	207	136	140	118	259	257	215	389	943	1,560	497	174	4,895
1928	116	101	95	133	205	278	234	564	1,080	1,406	544	193	5,011
1929	188	115	122	210	218	226	231	639	1,027	1,831	575	183	5,565
1930	126	101	99	134	142	216	206	465	907	1,024	761	282	4,463
1931	184	105	103	189	176	289	243	718	1,262	1,181	655	182	5,287
1932	124	80	77	143	100	172	181	460	535	803	501	196	3,373

Bureau of Agricultural Economics. Compiled from data of livestock and meat-reporting service of bureau.

TABLE 346.—*Sheep: Estimated average price per 100 pounds received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	6.88	6.83	7.06	7.20	6.92	6.43	6.43	6.22	6.57	6.33	6.20	6.39	6.65
1924	6.71	6.82	7.22	7.45	7.33	7.09	6.60	6.32	6.30	6.32	6.39	6.84	6.81
1925	7.86	8.41	8.20	8.42	7.53	7.04	7.17	7.32	7.27	7.31	7.81	7.79	7.70
1926	7.95	8.20	7.66	7.67	7.78	7.56	7.09	6.92	7.13	6.93	6.75	6.95	7.43
1927	6.87	7.16	7.41	7.40	7.68	7.27	7.16	7.13	7.06	7.05	7.42	7.38	7.20
1928	7.52	7.60	7.85	8.11	8.09	7.84	7.56	7.53	7.58	7.50	7.50	7.29	7.68
1929	7.84	7.98	8.36	8.40	8.09	7.86	7.25	7.32	7.01	6.83	6.75	6.61	7.55
1930	6.91	6.84	6.59	6.44	5.86	5.52	4.65	4.13	4.21	3.93	3.98	3.96	5.36
1931	4.04	4.15	4.24	4.24	3.91	3.28	3.01	3.00	2.80	2.63	2.63	2.52	3.43
1932	2.48	2.67	2.91	2.86	2.52	2.36	2.37	2.19	2.17	2.03	2.06	2.04	2.40

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by number of sheep Jan. 1, to obtain a price for the United States; yearly price obtained by weighting monthly prices by Federal inspected slaughter. For previous data see 1930 or earlier yearbooks.

TABLE 347.—*Lambs: Estimated average price per 100 pounds received by producers, United States, 1922–23 to 1932–33*

Year	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1922–23	9.87	9.55	9.39	9.43	10.06	10.30	10.49	10.69	10.83	11.01	10.69	11.00	10.30
1923–24	10.72	10.60	9.96	10.28	10.17	10.01	10.10	10.19	10.53	11.22	11.32	11.43	10.64
1924–25	11.21	10.50	10.15	10.18	10.35	10.55	10.96	12.69	13.13	13.48	12.22	11.99	11.45
1925–26	11.62	11.71	11.80	11.95	12.04	12.20	12.67	12.79	12.02	11.56	11.32	11.78	11.98
1926–27	12.07	11.52	11.12	11.32	11.31	11.11	10.92	10.65	10.84	11.56	11.97	11.92	11.36
1927–28	11.95	11.44	11.15	11.14	11.22	11.42	11.39	11.34	11.90	12.31	12.73	13.03	11.76
1928–29	13.18	12.25	11.88	11.97	11.57	11.60	11.41	12.23	12.60	13.12	13.36	12.79	12.31
1929–30	12.31	11.90	11.46	11.08	10.97	10.74	10.76	11.10	10.46	9.63	9.02	8.92	10.71
1930–31	9.02	8.08	6.82	6.67	6.15	6.21	6.18	6.30	6.59	6.84	6.94	6.96	6.92
1931–32	6.42	5.60	5.33	5.04	4.64	4.46	4.19	4.43	4.58	5.05	5.13	4.78	4.97
1932–33	4.49	4.37	4.11	4.11	3.95	3.91	3.95	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by number of lambs Jan. 1, to obtain a price for the United States; yearly price obtained by weighting monthly prices by receipts at principal markets. For previous data see 1930 or earlier yearbooks.

TABLE 348.—*Sheep and lambs: Average price per 100 pounds at Chicago, by months 1923–1932*

SHEEP

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [1]
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	7.72	8.08	8.64	8.90	6.74	5.00	5.16	7.09	7.25	6.35	6.89	7.37	7.10
1924	8.16	9.12	10.50	10.21	8.11	5.82	5.66	6.18	5.46	6.60	6.62	8.45	7.57
1925	10.33	9.69	9.22	7.84	7.96	6.25	7.48	6.83	6.95	7.64	8.16	9.57	8.16
1926	9.72	9.18	8.82	8.87	7.97	5.85	5.97	6.50	6.25	6.12	5.88	5.86	7.25
1927	6.94	8.03	8.88	9.62	7.44	5.88	6.25	6.47	6.14	6.00	6.40	6.41	7.04
1928	7.03	8.96	9.47	10.16	8.53	6.12	6.28	6.72	6.34	6.18	5.84	7.03	7.39
1929	9.32	8.78	9.72	10.34	6.78	6.28	5.85	5.34	4.56	4.70	5.38	5.41	6.87
1930	6.50	5.53	5.59	5.66	5.31	3.38	3.12	3.53	3.50	3.10	3.34	3.22	4.32
1931	3.97	4.25	4.54	3.90	2.78	1.62	2.50	2.03	1.58	1.94	2.16	2.18	2.79
1932	2.62	3.25	3.75	3.06	1.41	1.65	1.66	1.92	1.62	1.59	1.82	2.08	2.20

LAMBS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [1]
1923	14.69	14.85	14.56	14.42	14.12	14.81	14.22	12.89	13.52	12.93	12.75	12.96	13.89
1924	13.53	14.95	16.08	16.22	15.23	14.12	13.79	13.57	13.38	13.52	14.03	16.47	14.57
1925	18.28	17.50	16.28	14.85	13.06	15.86	15.11	14.88	15.19	15.20	15.44	16.15	15.66
1926	15.28	13.78	13.48	14.38	15.30	16.66	14.31	14.20	14.05	13.88	13.25	12.57	14.26
1927	12.64	13.28	15.27	15.87	14.75	15.66	14.25	13.68	13.46	13.70	13.80	13.14	14.12
1928	13.16	15.39	16.26	16.81	16.10	16.84	15.61	14.72	14.29	13.12	13.31	14.31	14.99
1929	16.37	16.53	17.07	16.82	13.62	15.34	14.38	13.50	13.19	12.72	12.72	13.22	14.62
1930	13.28	11.03	10.28	9.38	9.73	12.28	10.18	9.39	8.24	7.72	7.34	7.44	9.69
1931	8.43	8.10	8.31	9.06	8.55	7.72	6.62	6.88	6.49	5.88	5.64	5.32	7.26
1932	5.88	6.26	6.83	6.69	5.12	6.26	6.22	5.72	5.56	5.12	5.00	5.82	5.92

Bureau of Agricultural Economics. Bulk of sales prices from data of the livestock and meat reporting service of the bureau. Data for 1901–1922 are available in 1932 Yearbook, p. 802, Table 356. See Crops and Markets for current prices by classes, grades, and markets.

[1] Simple average of monthly prices.

TABLE 349.—*Sheep and lambs: Annual slaughter under Federal inspection, 1907–1932, estimated equivalent of Federal inspection, 1880–1906, and estimated total slaughter (including farm) in United States, 1900–1932* [1]

[In thousands—i. e., 000 omitted]

Calendar year	Federally inspected	Total [2]	Calendar year	Federally inspected	Total [2]	Calendar year	Federally inspected	Total [2]
1880	3,516	----------	1898	8,458	----------	1916	11,941	15,408
1881	3,968	----------	1899	8,858	----------	1917	9,345	12,149
1882	4,490	----------	1900	8,940	12,015	1918	10,320	13,359
1883	4,695	----------	1901	9,996	12,358	1919	12,691	16,317
1884	4,808	----------	1902	10,519	13,038	1920	10,982	14,180
1885	4,634	----------	1903	10,508	13,683	1921	13,005	16,710
1886	4,085	----------	1904	10,046	13,126	1922	10,929	14,112
1887	4,903	----------	1905	10,026	12,823	1923	11,529	14,862
1888	5,147	----------	1906	10,385	13,371	1924	11,991	15,441
1889	5,230	----------	1907	10,252	13,360	1925	12,001	15,454
1890	5,423	----------	1908	10,305	13,526	1926	12,961	16,689
1891	5,741	----------	1909	11,343	14,725	1927	12,883	16,589
1892	6,038	----------	1910	11,408	14,797	1928	13,488	17,348
1893	7,125	----------	1911	14,020	18,057	1929	14,023	18,048
1894	8,109	----------	1912	14,979	19,247	1930	16,697	21,132
1895	8,765	----------	1913	14,406	18,520	1931	16,071	23,038
1896	8,478	----------	1914	14,229	18,290	1932	17,899	----------
1897	8,417	----------	1915	12,212	15,756			

Bureau of Animal Industry and Bureau of Agricultural Economics.

[1] Federal meat inspection act enacted in 1906.
[2] Subject to revision.

TABLE 350.—*Sheep and lambs: Shipments, slaughter, value of production, and income, by States, 1931*

State and division	Shipments and local slaughter				Inshipments, stocker, feeding and breeding			
	Sheep		Lambs		Sheep		Lambs	
	Head	Total weight	Head	Total weight	Head	Total weight	Head	Total weight
	Thousands	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*	*Thousands*	*1,000 pounds*
Maine	16	1,600	14	840				
New Hampshire	4	400	2	120				
Vermont	7	700	10	600				
Massachusetts	2	220	1	65				
Rhode Island			1	65				
Connecticut	3	330	2	130				
New York	81	9,477	253	17,724	2	200	61	3,660
New Jersey	2	220	3	225	1	100		
Pennsylvania	31	3,255	187	13,090			3	180
North Atlantic	146	16,202	473	32,859	3	300	64	3,840
Ohio	116	13,340	819	57,330	1	100	87	5,655
Indiana	72	8,640	573	48,705	8	800	155	10,075
Illinois	50	6,000	569	48,365	15	1,500	259	18,130
Michigan	108	12,960	700	59,500	15	1,500	148	10,064
Wisconsin	55	6,050	409	32,720	7	770	190	13,300
East North Central	401	46,900	3,070	240,620	46	4,670	839	57,224
Minnesota	82	9,062	731	60,663	20	2,000	254	15,240
Iowa	126	15,120	1,038	83,040	43	4,300	500	32,500
Missouri	76	8,360	965	72,375	10	1,050	370	24,050
North Dakota	120	13,200	579	43,425	33	3,300	206	13,390
South Dakota	52	5,720	704	52,800	8	880	279	20,925
Nebraska	49	5,390	1,594	143,430	50	5,000	1,539	100,035
Kansas	46	5,060	540	48,590	20	2,000	422	27,430
West North Central	551	61,912	6,151	504,323	184	18,530	3,570	233,570
North Central	952	108,902	9,221	750,943	230	23,200	4,409	290,794
Delaware			3	195				
Maryland	9	990	69	5,520	2	220	2	130
Virginia	27	3,240	370	29,600	2	180		
West Virginia	36	3,960	361	28,880	1	110		
North Carolina	2	170	41	2,255				
South Carolina	1	90	5	225				
Georgia	2	170	9	450				
Florida	3	255	4	200				
South Atlantic	80	8,875	862	67,325	5	510	2	130
Kentucky	44	4,850	812	60,900	10	1,000	20	1,400
Tennessee	30	3,300	239	17,925	2	220		
Alabama	2	160	12	600				
Mississippi			12	600				
Arkansas	5	525	13	780				
Louisiana	1	93	9	450				
Oklahoma	24	2,520	93	6,045	8	800	30	1,500
Texas	820	77,900	1,178	70,740	10	1,000	51	3,060
South Central	926	89,348	2,368	158,040	30	3,020	101	5,960
Montana	527	57,970	2,025	151,875	3	330	5	375
Idaho	441	50,715	1,890	151,200	200	20,000	488	31,720
Wyoming	104	10,718	1,735	112,785	11	1,100	54	3,510
Colorado	244	25,620	2,210	176,800	200	20,000	1,359	85,617
New Mexico	167	16,700	520	33,800	7	700	20	1,400
Arizona	20	2,140	233	17,475				
Utah	205	21,935	1,229	86,030	28	2,800	41	2,870
Nevada	15	1,540	457	29,705	5	525	15	975
Washington	31	3,410	470	37,600	8	800	14	980
Oregon	265	28,355	1,205	91,580	5	550		
California	266	26,600	2,212	166,325	50	4,500	250	15,000
Western	2,285	245,703	14,186	1,055,175	517	51,305	2,246	142,447
United States	4,389	469,030	27,110	2,064,342	785	78,335	6,822	443,171

TABLE 350.—*Sheep and lambs: Shipments, slaughter, value of production, and income, by States, 1931*—Continued

State and division	Farm slaughter				Value of amount consumed on farms	Receipts from sales	Gross income	Value of production
	Sheep		Lambs					
	Head	Total weight	Head	Total weight				
	Thousands	*1,000 pounds*	*Thousands*	*1,000 pounds*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	1	100	9	540	11	162	173	146
New Hampshire			1	60	1	24	25	21
Vermont			2	120	2	67	69	59
Massachusetts			1	65	1	18	19	12
Rhode Island						5	5	5
Connecticut			1	65	1	27	28	22
New York	10	1,170	10	710	8	1,325	1,333	1,267
New Jersey			1	76	2	27	29	22
Pennsylvania	5	550	6	420	6	963	969	984
North Atlantic	16	1,820	31	2,055	32	2,618	2,650	2,538
Ohio	2	240	6	480	25	3,669	3,694	4,299
Indiana			1	80	4	2,869	2,873	2,883
Illinois	1	120	3	255	16	2,145	2,161	2,511
Michigan			7	525	12	3,449	3,461	3,828
Wisconsin	3	375	4	300	22	1,318	1,340	1,347
East North Central	6	735	21	1,700	79	13,450	13,529	14,868
Minnesota	2	248	4	324	21	3,198	3,219	3,239
Iowa	2	250	3	246	20	3,311	3,331	3,598
Missouri	2	240	3	225	15	3,313	3,328	3,108
North Dakota	4	480	6	480	32	1,667	1,699	2,029
South Dakota	3	330	4	300	24	1,873	1,897	2,252
Nebraska	2	220	3	225	21	4,368	4,389	3,287
Kansas	2	240	3	228	17	1,594	1,611	2,010
West North Central	17	2,008	26	2,028	150	19,324	19,474	19,523
North Central	23	2,743	47	3,728	229	32,774	33,003	34,391
Delaware			1	65	2	20	22	21
Maryland			1	80	3	407	410	383
Virginia	2	240	3	240	12	1,970	1,982	1,936
West Virginia	2	220	3	240	11	1,786	1,797	1,914
North Carolina	1	90	4	220	9	162	171	173
South Carolina			1	45	1	21	22	21
Georgia			2	100	3	40	43	40
Florida			1	50	2	28	30	25
South Atlantic	5	550	16	1,040	43	4,434	4,477	4,513
Kentucky	2	240	3	225	16	4,528	4,544	4,535
Tennessee	2	220	3	225	16	1,454	1,470	1,502
Alabama			2	100	3	60	63	62
Mississippi			3	150	5	40	45	69
Arkansas	1	105	2	120	4	53	57	65
Louisiana	1	93	2	100	6	40	46	71
Oklahoma	1	110	1	65	6	355	361	306
Texas	4	360	6	420	28	5,957	5,985	7,488
South Central	11	1,128	22	1,405	84	12,487	12,571	14,098
Montana	7	840	15	1,125	52	8,265	8,317	6,889
Idaho	5	575	20	1,600	75	6,079	6,154	6,059
Wyoming	10	1,100	20	1,400	87	5,874	5,961	6,591
Colorado	10	1,050	15	1,200	103	7,237	7,340	6,339
New Mexico	55	5,500	15	1,050	211	1,922	2,133	3,049
Arizona	40	4,280	10	750	230	1,322	1,552	1,927
Utah	25	2,675	15	1,125	124	4,849	4,973	4,400
Nevada	7	700	8	544	42	1,442	1,484	1,406
Washington	4	480	6	480	16	2,012	2,028	2,025
Oregon	10	1,100	15	1,140	58	5,128	5,186	5,191
California	20	2,000	30	2,310	146	10,399	10,545	9,897
Western	193	20,300	169	12,724	1,144	54,529	55,673	53,773
United States	248	26,541	285	20,952	1,532	106,842	108,374	109,313

Bureau of Agricultural Economics. Estimates of Division of Crop and Livestock Estimates and are preliminary. The figures on income as shown in Tables 451 and 452 are computed from the data shown in this table. The difference between value of production and income arises from the fact that in computing value of production allowance is made for changes in inventory numbers between the beginning and end of the year, while in computing income these changes are not used.

TABLE 351.—*Mutton and lamb: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
New Zealand	301,079	0	317,539	0	305,951	0	381,914	0	387,861	0
Argentina	176,547	0	171,108	0	177,576	0	177,693	0	184,106	0
Australia [2]	*72,153*	*17*	*46,363*	*4*	*84,929*	*24*	*100,411*	*0*	*109,253*	*0*
Uruguay	41,048	0	31,011	0	49,267	0	62,304	0		
Netherlands	14,942	1,049	14,380	759	12,859	692	11,342	550	11,015	598
Irish Free State	1,370	344	2,359	312	2,771	246	2,003	259	2,780	250
Union of South Africa	171	20	201	47	160	0	299	0	141	0
Total	607,310	1,430	582,960	1,122	633,513	962	735,966	809	695,150	848
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	629,309	0	640,414	0	642,712	0	730,271	0	813,107
France	*213*	*22,035*	*306*	*15,173*	*140*	*21,280*	*143*	*27,679*	*448*	*41,789*
Germany	637	7,868	79	9,909	3	9,129	2,457	9,679	1,480	342
United States	1,087	7,255	1,024	9,202	835	11,305	1,261	8,181	550	5,503
Norway	0	4,581	0	4,358	0	4,715	0	4,904	0	3,560
Belgium	702	3,703	445	3,970	1,125	4,875	1,724	4,391	567	4,076
Canada	1,501	2,335	1,128	2,333	573	4,401	242	4,412	333	1,185
Denmark	0	2,152	1	2,397	0	2,588	6	2,638	5	2,552
Sweden	36	1,058	45	1,089	38	953	25	1,515	7	1,837
Total	4,185	680,356	3,028	688,846	2,714	702,048	5,848	793,670	3,390	873,971

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary. [2] Year ended June 30.

TABLE 352.—*Mutton and lamb, frozen: Cold-storage holdings, United States, 1923–1932*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1923	4,523	5,980	5,758	6,635	5,774	4,445	3,556	2,752	1,785	1,719	1,997	2,014
1924	2,493	2,306	2,173	1,719	2,093	2,273	2,917	2,257	2,230	2,525	3,166	3,328
1925	2,949	2,336	2,294	2,090	1,998	1,913	1,535	1,349	1,339	1,112	1,435	1,549
1926	1,820	2,354	3,346	3,289	2,393	1,697	1,871	1,813	1,929	2,234	2,814	3,166
1927	4,556	4,447	4,074	2,940	1,862	1,210	1,360	1,161	1,302	1,991	2,958	3,790
1928	4,408	4,404	4,020	3,252	1,828	1,276	1,947	1,822	1,691	2,113	4,321	5,472
1929	5,623	4,009	3,252	3,109	2,533	2,461	3,061	2,639	3,159	4,113	4,992	5,194
1930	5,317	4,667	5,408	5,174	5,190	4,639	4,820	4,476	3,977	4,320	4,326	4,628
1931	4,677	4,061	3,573	3,063	2,529	2,371	2,685	1,892	1,975	1,908	1,975	1,985
1932	2,318	1,947	1,784	1,222	1,061	1,016	1,010	1,012	1,305	1,983	2,974	2,904

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

TABLE 353.—*Wool, shorn: Estimated production by States, 1930–1932*

State and division	Production			Number of fleeces [1]			Weight per fleece [2]		
	1930	1931	1932	1930	1931	1932	1930	1931	1932
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*Thousands*	*Thousands*	*Thousands*	*Pounds*	*Pounds*	*Pounds*
Maine	471	491	444	76	78	74	6.2	6.3	6.0
New Hampshire	113	107	101	18	17	16	6.3	6.3	6.3
Vermont	255	252	238	38	37	35	6.7	6.8	6.8
Massachusetts	66	59	59	11	10	10	6.0	5.9	5.9
Rhode Island	12	12	12	2	2	2	6.2	5.9	5.9
Connecticut	46	51	50	8	9	9	5.8	5.7	5.6
New York	3,110	3,008	2,730	432	412	380	7.2	7.3	7.2
New Jersey	37	43	36	6	7	6	6.1	6.2	6.0
Pennsylvania	3,108	3,248	3,270	420	433	436	7.4	7.5	7.5
North Atlantic	7,218	7,271	6,940	1,011	1,005	968	7.1	7.2	7.2
Ohio	15,066	15,453	15,455	1,860	1,818	1,908	8.1	8.5	8.1
Indiana	4,752	4,980	4,782	660	673	655	7.2	7.4	7.3
Illinois	4,815	4,843	4,559	664	647	619	7.3	7.5	7.4
Michigan	8,400	8,526	8,282	1,050	1,015	1,010	8.0	8.4	8.2
Wisconsin	3,225	3,205	3,145	430	439	425	7.5	7.3	7.4
East North Central	36,258	37,007	36,223	4,664	4,592	4,617	7.8	8.1	7.8
Minnesota	6,115	6,591	6,638	784	845	885	7.8	7.8	7.5
Iowa	7,640	7,920	7,901	955	990	1,013	8.0	8.0	7.8
Missouri	6,865	7,304	7,048	1,070	1,090	1,054	6.4	6.7	6.7
North Dakota	6,264	7,012	7,802	737	825	940	8.5	8.5	8.3
South Dakota	7,704	8,820	8,960	939	1,050	1,120	8.3	8.4	8.0
Nebraska	3,000	2,786	1,885	400	380	254	7.5	7.3	7.4
Kansas	3,365	3,243	3,108	498	475	463	6.8	6.8	6.8
West North Central	41,043	43,676	43,402	5,383	5,655	5,729	7.6	7.7	7.6
North Central	77,301	80,683	79,625	10,047	10,247	10,346	7.7	7.9	7.7
Delaware	19	24	24	3	4	4	6.2	6.0	6.0
Maryland	580	552	570	92	89	92	6.3	6.2	6.2
Virginia	2,200	2,225	2,185	440	445	446	5.0	5.0	4.9
West Virginia	2,844	3,021	2,994	547	570	565	5.2	5.3	5.3
North Carolina	376	394	346	80	82	77	4.7	4.8	4.5
South Carolina	52	52	48	12	12	12	4.3	4.3	4.0
Georgia	112	112	112	33	33	31	3.4	3.4	3.6
Florida	114	111	115	38	37	37	3.0	3.0	3.1
South Atlantic	6,297	6,491	6,394	1,245	1,272	1,264	5.1	5.1	5.1
Kentucky	4,175	4,238	4,275	835	830	855	5.0	5.1	5.0
Tennessee	1,423	1,531	1,533	331	348	365	4.3	4.4	4.2
Alabama	160	143	144	47	42	40	3.4	3.4	3.6
Mississippi	274	274	257	83	83	78	3.3	3.3	3.3
Arkansas	181	198	220	42	44	49	4.3	4.5	4.5
Louisiana	425	443	403	125	123	112	3.4	3.6	3.6
Oklahoma	1,034	1,069	1,102	136	137	145	7.6	7.8	7.6
Texas	48,262	53,360	57,105	6,232	6,836	7,050	7.7	7.8	8.1
South Central	55,934	61,251	65,039	7,831	8,443	8,694	7.1	7.3	7.5
Montana	34,034	38,313	32,300	3,740	3,870	3,400	9.1	9.9	9.5
Idaho	18,156	19,419	16,500	2,040	2,134	1,940	8.9	9.1	8.5
Wyoming	29,702	36,000	30,510	3,264	3,600	3,390	9.1	10.0	9.0
Colorado	13,446	13,541	12,000	1,660	1,736	1,600	8.1	7.8	7.5
New Mexico	16,870	16,632	16,600	2,343	2,520	2,520	7.2	6.6	6.6
Arizona	5,640	5,520	5,220	940	920	870	6.0	6.0	6.0
Utah	24,440	23,940	18,160	2,600	2,660	2,270	9.4	9.0	8.0
Nevada	7,944	8,880	6,705	993	1,110	894	8.0	8.0	7.5
Washington	6,175	6,192	5,506	650	645	605	9.5	9.6	9.1
Oregon	21,375	22,000	18,630	2,375	2,500	2,300	9.0	8.8	8.1
California	25,779	26,095	24,219	3,528	3,622	3,370	7.3	7.2	7.2
Western	203,561	216,532	186,350	24,133	25,317	23,159	8.4	8.6	8.0
United States	350,311	372,228	344,354	44,267	46,284	44,431	7.9	8.0	7.8

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Include fleeces taken at commercial feeding plants. California figures include some fleeces taken from early lambs.

[2] In States where sheep are shorn twice a year, principallly Texas and California, this figure covers wool per head of sheep shorn and not weight per fleece.

TABLE 354.—*Wool: Estimated production in specified countries, average 1923–1925, annual 1927–1932*

Country	Average, 1923–1925[1]	1927	1928	1929	1930	1931	1932
SOUTHERN HEMISPHERE	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*
Australia	757.7	888.1	908.2	937.6	912.1	950.0	[2] 984.5
New Zealand [3]	205.8	229.0	239.0	241.8	265.7	265.5	[4] 250.0
Argentina [4]	310.0	336.0	352.0	320.0	351.0	333.0	[2] 331.0
Uruguay [4]	104.0	131.0	128.0	146.0	149.0	[6] 106.0	[6] 117.0
Chile [5]	25.2	28.4	27.9	27.1	26.7	28.0	------
Union of South Africa [5 7]	198.4	290.7	310.9	303.8	305.0	[2] 300.0	[2] 301.0
Total of countries reporting to 1932	1,575.9	1,874.8	1,938.1	1,951.2	1,982.8	1,960.5	1,983.5
NORTHERN HEMISPHERE							
United States:							
Shorn	240.0	289.9	314.6	327.6	350.3	372.2	344.4
Pulled [8]	44.4	50.1	51.9	54.5	61.9	66.1	67.1
Total	284.4	340.0	366.5	382.1	412.2	438.3	411.5
Canada	15.4	18.7	19.6	20.3	21.0	20.4	20.9
Europe:							
United Kingdom [9]	108.8	122.8	123.6	121.9	120.5	123.8	[4] 127.7
Irish Free State [9]	13.7	14.8	15.1	15.5	14.7	15.0	[2] 14.6
Norway	5.9	6.2	5.4	5.2	[4] 5.4	[4] 5.5	[4] 5.7
France	44.1	47.6	47.2	46.1	45.2	[4] 43.9	[4] 42.0
Spain [10]	71.0	77.6	(70.0)	[11] 73.0	(70.0)	68.1	[4] 76.0
Italy [10]	59.1	56.3	52.3	49.6	44.1	42.0	------
Germany	50.7	35.9	33.6	31.9	30.6	[4] 30.8	[4] 30.7
Czechoslovakia	4.0	[10] 3.8	[10] 3.7	[10] 3.7	[10] 3.7	2.7	[4] 2.3
Hungary	12.4	11.8	11.5	11.5	13.0	[4] 12.8	[4] 8.8
Yugoslavia	30.6	28.0	28.0	28.0	28.0	28.8	[4] 30.5
Greece	18.1	17.5	10.6	17.8	16.3	[4] 19.0	------
Rumania [10]	48.6	51.6	49.2	48.6	47.1	46.5	47.0
Poland	9.6	8.8	9.6	10.4	9.6	[4] 10.0	------
Total of countries reporting all periods to 1932	389.8	400.1	393.3	385.4	378.2	377.9	385.9
Africa and Asia: [12]							
Algeria	33.9	36.8	36.8	47.1	49.3	28.1	------
Turkey	10.1	11.9	8.5	5.0	14.1	14.8	10.1
Total 13 Northern Hemisphere countries all periods to 1932	699.7	770.7	787.0	792.8	825.5	851.4	828.4
Total 18 Northern and Southern Hemisphere countries reporting all periods to 1932	2,275.6	2,645.5	2,786.0	2,744.0	2,808.3	2,811.9	2,811.9
Estimated world total excluding Russia and China [13]	2,741.0	3,106.0	3,252.0	3,235.0	3,295.0	[14] 3,274.4	------
Russia	315.0	369.0	391.8	394.2	310.8	[4] 250.0	------
China [15]	56.2	48.0	64.8	50.2	26.1	31.9	------

Bureau of Agricultural Economics. Includes wool shorn during the calendar year in the Northern Hemisphere and that shorn during the season beginning July 1 or Oct. 1 of the given calendar year in the Southern Hemisphere. The bulk of the season's clip in the Southern Hemisphere is shorn during the last half of the calendar year. Pulled wool is included in the total for most important producing countries at its grease equivalent. Figures in parentheses are interpolated. For table showing all countries see Foreign Crops and Markets, annual wool review in March or April, 1933, and for current information see monthly World Wool Prospects.

[1] *Average for years indicated whenever available, otherwise for any year or years within or near this period.*
[2] Estimate furnished by cable from agricultural representative.
[3] *Estimates of Dalgety & Co. as comparable figures are available up to date.* Official figures recently issued by the farm economies section of the New Zealand Department of Agriculture place total production as follows, in millions of pounds: *1923–1925, 195; 1926, 214; 1927, 226; 1928, 239; 1929, 252.*
[4] Estimate based on sheep numbers at date nearest shearing time and other available data.
[5] Estimates based on exports alone or on exports, stocks, and *domestic consumption.*
[6] Estimates furnished by Wool Record and Textile World, quoting official source.
[7] Estimates of Agricultural Attaché C. C. Taylor. *Estimates include imports from surrounding territory,* Basutoland, etc., which are exported through Union ports.
[8] Published as reported by wool pulling establishments and is mostly washed. The *U. S. Bureau of the* Census considers 1 pound pulled wool the equivalent of 1⅓ pounds grease.
[9] Estimates of the Empire Wool Marketing Board. Skin wool included and converted to a grease basis. The combined total for these four countries as estimated by the Yorkshire Observer was formerly used in this table.
[10] Revisions based on recent census figure of wool production or of sheep numbers.
[11] Census figures.
[12] Estimate for Asiatic countries rough approximations only.
[13] Totals subject to revision. Few countries publish official wool-production figures. *In the absence of* official figures for most countries various estimates have been used, some have been supplied by Government representatives abroad, others are based on sheep numbers at the date nearest shearing time. For some principal exporting countries, exports alone, or exports, stocks and domestic consumption have been used as representing production. In the case of some Asiatic countries rough commercial estimates have been used while the figures of the U. S. Department of Commerce or the National Association of Wool Manufacturers have been used for some countries.
[14] Estimate based on production in 30 countries which furnish 90 per cent of world production, exclusive of Russia and China in 1930.
[15] Exports of sheep's wool only.

163050°—33——40

TABLE 355.—*Wool: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Australia [2]	739, 123	3, 990	764, 760	3, 819	851, 762	2, 393	----	----
Argentina	294, 973	302	284, 313	336	297, 643	116	310, 252	84
Union of South Africa	254, 431	570	296, 917	701	281, 898	245	242, 092	612
New Zealand	220, 228	103	234, 956	73	197, 240	13	211, 719	6
Uruguay	117, 856	0	112, 619	0	165, 952	0	----	----
China	58, 272	568	59, 864	444	30, 743	210	35, 217	----
British India	60, 373	27, 843	50, 774	26, 128	32, 193	14, 461	39, 010	5, 849
Chile	26, 196	435	23, 519	554	21, 082	447	22, 350	163
Algeria	24, 047	3, 632	21, 203	3, 534	18, 592	2, 043	10, 585	1, 524
Morocco	13, 345	0	7, 195	0	4, 024	0	2, 536	0
Irish Free State	12, 706	1, 282	13, 116	1, 043	7, 283	779	10, 877	869
Persia [3]	11, 918	1, 380	11, 713	1, 211	12, 621	399	----	----
Hungary	11, 715	1, 643	11, 317	1, 460	8, 718	1, 649	8, 392	2, 166
Brazil	11, 021	----	11, 392	----	16, 229	----	15, 412	----
Peru	10, 760	1	10, 569	4	7, 151	5	9, 287	----
Spain	9, 715	4, 918	10, 674	6, 111	6, 051	7, 320	2, 677	10, 643
Egypt and Sudan	3, 907	[4] −127	4, 790	[4] −296	2, 288	[4] −81	3, 578	[4] −92
Tunis	2, 982	1, 383	2, 503	1, 666	1, 039	1, 280	1, 172	566
Total	1, 873, 658	47, 929	1, 938, 194	46, 788	1, 962, 509	31, 278	925, 156	22, 390
PRINCIPAL IMPORTING COUNTRIES								
France	53, 286	633, 028	64, 728	686, 487	52, 562	690, 269	57, 027	570, 278
United Kingdom	54, 037	473, 061	51, 984	503, 232	32, 661	513, 619	35, 771	600, 730
Germany	24, 109	361, 447	34, 973	376, 437	23, 384	347, 966	30, 476	328, 575
United States	322	288, 346	239	280, 871	162	163, 734	274	158, 385
Belgium	19, 091	135, 887	35, 873	169, 621	33, 410	159, 166	33, 119	137, 185
Italy	7, 188	99, 134	6, 398	120, 248	4, 314	119, 587	6, 985	105, 094
Japan	0	93, 489	0	107, 429	0	115, 025	0	189, 714
Russia	[2] 4, 024	46, 005	112	86, 429	86	72, 139	----	----
Czechoslovakia	3, 381	35, 889	3, 164	43, 454	1, 813	39, 530	2, 423	40, 227
Poland	1, 398	30, 255	908	35, 003	334	32, 403	261	35, 345
Switzerland	45	17, 404	47	17, 827	50	19, 790	643	18, 402
Austria	973	16, 490	499	19, 506	372	16, 611	158	13, 008
Canada	7, 307	13, 930	6, 090	12, 086	4, 382	9, 459	4, 770	10, 854
Sweden	241	10, 828	274	12, 512	234	10, 562	217	11, 735
Netherlands	2, 830	10, 518	3, 244	12, 119	2, 268	16, 786	3, 062	16, 335
Yugoslavia	117	5, 559	142	4, 578	67	7, 269	75	6, 535
Rumania	1, 287	[5] 4, 011	[2] 2, 393	[2] 5, 305	1, 221	3, 860	----	----
Denmark	355	2, 808	269	3, 657	94	3, 299	142	4, 041
Finland	----	2, 806	----	2, 587	----	2, 075	----	2, 268
Bulgaria	3	2, 699	0	3, 760	35	2, 056	0	4, 832
Greece	641	2, 063	616	2, 615	624	2, 803	303	2, 901
Norway	601	1, 812	641	1, 542	214	1, 771	237	1, 832
Total	181, 236	2, 287, 557	212, 594	2, 506, 805	158, 287	2, 349, 779	175, 943	2, 256, 276

Bureau of Agricultural Economics. Official sources except where otherwise noted. "Wool" in this table includes: Washed, unwashed, scoured, pulled wool, slipe, also hair—camel's, mohair, angora goat, cashmere goat, and alpaca. The following items have been considered as not within this classification: Carded, combed, dyed wool, flocks; sheep, lamb, and goat skins with hair on, mill waste, noils, and tops.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Figures for Persia are for 12 months ended Mar. 21 of the year following year shown.
[4] Excess of reexports over imports.
[5] 4-year average.

Table 356.—*Wool: Production, exports, imports, and amount available for consumption, of combing and clothing wool, and imports of carpet wool, United States, 1910–1932*

Calendar year	Combing and clothing						Carpet, imports, less reexports
	Production			Exports, domestic [1]	Imports, less reexports [1]	Available for consumption [2]	
	Shorn	Pulled	Total				
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1910	281,363	40,000	321,363	[3] 48	94,374	415,689	76,705
1911	277,548	41,000	318,548	([4])	50,928	369,476	101,484
1912	262,543	41,500	304,043	([5])	111,653	415,696	124,849
1913	252,675	43,500	296,175	[3] 77	61,306	357,404	86,416
1914	247,192	43,000	290,192	[3] 335	165,882	455,739	84,277
1915	245,720	40,000	285,720	[3] 8,158	307,354	584,922	93,175
1916	244,890	43,600	288,490	3,919	364,355	648,895	76,107
1917	241,892	40,000	281,892	1,827	341,864	621,929	73,002
1918	256,870	42,000	298,870	407	377,682	676,145	69,202
1919	249,958	48,300	298,258	2,840	336,774	632,192	96,873
1920	250,617	42,900	293,517	8,845	207,419	492,091	35,093
1921	241,465	48,500	289,965	1,027	217,233	505,271	97,820
1922	228,109	42,000	270,109	455	189,488	459,142	172,828
1923	229,895	42,500	272,395	535	243,270	515,130	121,518
1924	237,131	43,800	280,931	309	94,495	375,117	140,684
1925	252,832	46,800	299,632	273	171,980	471,339	157,579
1926	268,900	49,600	318,500	292	170,142	488,350	115,235
1927	289,909	50,100	340,009	323	109,850	449,536	143,871
1928	314,588	51,900	366,488	485	87,132	453,135	148,704
1929	327,560	54,500	382,060	239	100,352	482,170	174,483
1930	350,311	61,900	412,211	162	68,000	480,049	92,756
1931	372,228	66,100	438,328	274	36,772	474,826	119,039
1932	344,354	67,100	411,454	179	12,020	423,295	40,697

Bureau of Agricultural Economics. *Production figures, 1910–1913, from the National Association of Wool Manufacturers; beginning 1914, from the bureau; imports and exports from the Bureau of Foreign and Domestic Commerce.*

Note.—The total United States production is combing and clothing only.

[1] Hair of angora goat, alpaca, and other like animals included in exports for all years and in imports and reexports prior to 1914.

[2] In computing these figures, stocks not taken into consideration.

[3] Exports for fiscal year ended June 30 of the year shown.

[4] Included in all other articles.

[5] No transactions.

Table 357.—*Wool, shorn: Estimated average price per pound received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	35.3	35.3	37.3	39.2	41.7	41.5	38.3	37.0	37.1	36.9	36.4	36.2	38.9
1924	36.6	37.5	38.2	38.4	37.4	36.0	34.3	33.5	35.5	37.3	40.1	42.2	36.9
1925	42.8	43.2	43.0	40.8	36.9	35.7	39.4	38.1	37.8	37.2	37.8	39.5	38.5
1926	38.9	37.7	34.7	33.2	32.0	31.4	31.9	31.9	32.6	31.6	31.6	30.1	32.5
1927	30.9	31.1	31.3	30.4	30.1	30.2	30.7	31.2	31.2	30.9	31.1	32.0	30.7
1928	33.2	34.4	35.4	35.6	37.0	38.7	37.6	37.0	36.5	36.0	35.9	35.6	36.7
1929	35.9	35.9	35.5	33.8	31.3	30.2	29.4	29.2	29.0	28.6	28.5	27.8	30.9
1930	27.4	25.9	23.7	21.4	19.6	19.2	19.2	19.8	20.2	19.6	19.0	18.4	20.3
1931	17.4	16.4	15.9	15.6	14.4	13.0	12.7	13.1	13.2	12.5	13.1	12.9	13.9
1932	12.5	13.0	12.5	11.0	8.8	7.2	7.0	7.4	9.1	9.5	9.4	9.2	9.0

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number of sheep Jan. 1, to obtain a price for the United States; yearly price obtained by using estimates of the Division of Crop and Livestock Estimates and the Division of Statistical and Historical Research.

TABLE 358.—*Wool: Boston market: Average price per pound, 1923–1932*

SCOURED BASIS, TERRITORY, GRADES 64's, 70's, 80's (FINE STRICTLY COMBING)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	143	144	144	149	153	150	144	137	132	130	130	134	141
1924	139	130	142	138	135	129	130	137	142	147	154	164	141
1925	168	164	153	138	126	130	137	132	129	128	131	131	139
1926	127	124	118	116	112	110	116	116	116	116	114	110	116
1927	110	110	110	109	108	108	111	111	111	112	112	112	110
1928	116	116	110	117	119	120	120	115	112	112	113	114	116
1929	114	110	108	104	100	97	94	94	93	90	88	84	98
1930	82	79	78	70	75	76	76	76	76	75	73	72	76
1931	68	66	66	66	64	62	62	64	62	59	59	59	63
1932	58	56	54	49	44	38	36	41	48	48	47	45	47

SCOURED BASIS, TERRITORY, GRADE 56's (THREE-EIGHTHS BLOOD STRICTLY COMBING)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1923	100	103	105	107	111	111	109	105	103	101	104	108	106
1924	113	116	116	113	109	97	100	109	113	117	122	133	113
1925	136	136	125	109	96	99	105	101	102	102	108	109	110
1926	103	99	93	91	89	89	90	90	91	93	93	91	92
1927	90	90	90	90	88	88	90	91	91	94	94	94	91
1928	97	99	100	106	107	108	107	103	104	104	104	104	104
1929	104	104	101	95	89	88	88	90	90	89	87	82	92
1930	75	70	67	64	62	62	62	62	62	60	59	58	63
1931	55	52	51	51	48	46	49	51	51	48	48	48	50
1932	49	49	46	42	37	32	30	34	43	42	41	39	40

GREASE BASIS, OHIO AND SIMILAR, GRADE 56's (THREE-EIGHTHS BLOOD STRICTLY COMBING)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1923	55	56	56	56	56	57	56	54	53	52	53	54	55
1924	55	56	57	55	53	49	48	53	55	59	63	69	56
1925	70	69	60	55	46	49	53	52	50	52	54	54	56
1926	54	53	49	46	44	43	44	44	44	45	46	45	46
1927	45	45	45	44	42	42	43	44	45	46	47	48	45
1928	50	52	52	53	55	57	56	55	55	55	56	56	54
1929	56	55	54	50	45	44	45	45	45	45	44	42	48
1930	39	36	34	32	29	30	30	30	30	30	29	28	31
1931	26	25	24	23	22	22	22	23	24	24	24	24	24
1932	24	23	22	20	17	16	14	17	22	22	20	20	20

Bureau of Agricultural Economics. 1923 average of weekly range quotations from the Boston Commercial Bulletin, and 1924–1932 prices from the livestock and meat reporting service of the bureau.

TABLE 359.—*Wool, grades 56's, 64's–67's: Average price per pound at London, clean basis, 1923–1932*

GRADE 56's

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	73.00	71.90	73.45	80.00	80.90	77.00	76.60	77.10	77.60	77.60	76.20	80.00	76.78
1924	80.90	84.20	85.00	83.75	82.50	82.00	81.50	87.15	92.80	101.00	105.00	111.30	89.76
1925	105.00	90.80	89.00	80.90	72.80	73.85	74.90	70.75	66.60	66.60	66.60	66.60	77.03
1926	60.80	60.80	60.80	59.80	58.30	56.80	58.80	59.80	60.80	59.80	57.00	58.80	59.36
1927	58.80	68.00	71.00	66.00	66.90	67.40	67.90	68.40	68.90	70.95	73.00	75.00	68.52
1928	77.00	80.00	81.10	79.55	78.00	77.50	77.00	74.00	71.00	70.00	73.00	74.00	76.01
1929	75.00	69.95	63.90	61.80	58.60	56.75	54.70	52.70	50.69	46.64	50.69	50.69	57.69
1930	40.55	40.55	34.47	35.48	37.51	37.00	36.00	34.50	32.44	30.42	26.36	20.36	34.30
1931	21.29	24.33	29.91	28.39	26.36	25.35	24.84	23.32	21.29	20.26	24.02	21.09	24.20
1932	20.73	23.04	21.61	19.92	18.38	18.23	19.60	20.64	21.69	20.52	19.79	19.13	20.27

TABLE 359.—*Wool, grades 56's, 64's–67's: Average price per pound at London, clean basis, 1923–1932*—Continued

GRADES 64's–67's

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	112.40	107.00	107.70	106.40	115.50	110.70	111.00	111.30	111.60	112.50	112.60	113.70	111.03
1924	117.90	121.80	121.60	122.00	123.15	122.68	122.20	130.75	139.30	138.00	148.40	150.30	129.84
1925	140.10	130.00	119.70	115.95	112.20	112.60	113.00	110.00	107.00	108.90	111.00	101.00	116.12
1926	97.30	97.30	97.30	98.10	97.70	97.30	94.30	94.80	95.30	93.30	92.75	90.75	95.51
1927	89.20	94.00	95.30	94.30	95.30	95.80	96.30	96.85	97.40	98.40	99.40	99.40	95.97
1928	101.40	102.00	103.40	102.40	101.40	101.40	101.40	98.35	95.30	90.00	93.30	91.20	98.46
1929	91.20	90.00	85.20	83.00	79.00	76.25	73.50	70.00	66.91	64.88	63.87	62.86	75.55
1930	54.75	54.75	50.69	52.72	55.76	54.70	52.70	51.70	50.69	50.69	44.61	41.57	51.28
1931	34.47	38.53	44.61	42.58	42.58	40.55	39.54	37.51	34.47	30.79	31.78	28.00	36.95
1932	29.31	30.24	29.57	28.91	27.56	27.35	28.10	29.33	31.10	29.72	27.98	27.32	28.87

Bureau of Agriculture Economics. These data were obtained from prices given by Kreglinger & Fernau for the opening and closing of each series of the London wool sales. For months when no sales were held the figures are interpolations of nearest actual prices. Conversions at monthly average rate of exchange as given in Federal Reserve Bulletins to December, 1925, and October, 1931, to December, 1932; others at par.

TABLE 360.—*Goats and mohair: Estimates of goats clipped, mohair produced, and average clip per goat (principal producing States), 1930–32*

State	Goats clipped			Mohair (including kid hair) produced			Average clip per goat clipped [1]		
	1930	1931	1932 [2]	1930	1931	1932 [2]	1930	1931	1932 [2]
	Thousands	*Thousands*	*Thousands*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Pounds*	*Pounds*	*Pounds*
Texas [3]	3,518	3,680	3,421	14,800	16,400	14,000	4.2	4.5	4.2
New Mexico	209	236	250	815	933	1,000	3.9	4.0	4.0
Arizona	225	250	200	900	960	760	4.0	3.8	3.8
California	40	39	37	140	136	130	3.5	3.5	3.5
Oregon	120	115	115	480	472	460	4.0	4.1	4.0
Missouri	67	68	66	168	170	145	2.5	2.5	2.2
Total	4,179	4,388	4,089	17,303	19,071	16,495	4.1	4.3	4.0

Bureau of Agricultural Economics. Estimates of Crop Reporting Board.

[1] In States where goats are clipped twice a year figures include both spring and fall clip.

[2] Preliminary.

[3] Most goats clipped twice a year. In Texas, kids are clipped in fall of year of birth. Figures include both goats and kids clipped.

TABLE 361.—*Imported meat and meat products, federally inspected and passed, United States, 1923–1932*

Year ended June 30	Chilled and frozen fresh meats		Canned and cured meats	Other meat products	Total weight
	Beef	Other			
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1923	25,999,968	12,871,364	9,635,315	1,341,067	49,847,714
1924	18,105,128	8,489,138	10,648,605	1,391,060	38,633,931
1925	5,612,600	11,827,557	12,857,043	2,877,640	33,174,840
1926	9,975,359	12,402,230	19,258,401	3,144,968	44,780,958
1927	14,956,143	22,508,681	43,714,607	5,454,741	86,634,172
1928	38,168,121	18,880,547	63,189,480	12,102,635	132,340,783
1929	53,085,288	15,704,668	89,511,853	11,563,215	169,865,014
1930	23,909,708	6,783,637	98,128,169	8,065,195	136,886,709
1931	2,612,713	1,314,170	23,854,583	5,651,509	33,423,975
1932	540,141	1,402,900	25,465,159	3,530,632	30,938,832

Bureau of Animal Industry.

TABLE 362.—*Livestock: Number of animals slaughtered under Federal inspection and number of whole carcasses condemned,*[1] *1923–1932*

Year ended June 30	Cattle		Calves		Sheep and lambs		Goats		Hogs		Horses		Total slaughter
	Slaughter	Condemned	Slaughter	Condemned	Slaughter	Condemned	Slaughter	Condemned	Slaughter	Condemned	Slaughter	Condemned	
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1923	9,030	73.3	4,338	11.8	11,404	13.3	25	0.1	48,600	196.3	1	0.0	73,398
1924	9,189	83.9	4,668	12.7	11,505	12.9	31	.3	54,416	232.7	5	.0	79,814
1925	9,774	92.1	5,185	11.1	12,203	12.7	27	.1	48,460	180.4	12	.0	75,660
1926	10,098	103.6	5,312	11.9	12,354	14.5	43	.1	40,443	143.0	40	.1	68,289
1927	10,050	83.5	5,080	10.6	12,894	16.4	30	.1	42,650	173.6	43	.2	70,747
1928	9,040	69.4	4,774	9.9	12,984	15.4	20	.1	48,347	154.2	107	.3	75,273
1929	8,284	61.9	4,526	8.9	13,769	20.1	21	.1	47,164	139.4	117	.4	73,881
1930	8,281	59.5	4,401	9.5	15,307	22.9	22	.1	46,689	135.4	136	.5	74,926
1931	8,209	52.4	4,732	9.1	17,300	18.5	9	.1	44,021	121.8	135	.7	74,406
1932	7,975	53.8	4,605	10.2	18,660	17.6	8	.0	45,852	139.9	100	.3	77,200

Bureau of Animal Industry.

[1] The numbers of condemned carcasses are expressed in thousands and tenths; that is, the last figure represents hundreds. These figures do not include parts of carcasses, data concerning which may be obtained from the Bureau of Animal Industry.

TABLE 363.—*Meat and meat products prepared under Federal inspection, 1923–32*

Year ended June 30	Pork placed in cure	Sausage	Canned meats	Lard	Lard compounds and substitutes	Oleo products	Oleomargarine	All other products	Total
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1923	3,366,258	679,317	160,282	2,017,763	336,851	278,137	129,708	1,920,171	8,888,547
1924	3,502,368	707,323	183,260	2,110,660	363,320	259,008	142,881	2,136,020	9,404,840
1925	3,176,714	736,877	214,650	1,733,933	458,518	287,271	133,836	2,170,278	8,912,077
1926	2,850,675	771,741	214,166	1,598,754	543,913	275,636	148,331	2,007,854	8,411,070
1927	2,920,206	765,074	248,459	1,691,344	535,175	280,641	148,384	1,971,827	8,561,110
1928	3,036,063	778,311	255,379	1,846,796	472,839	237,506	152,085	2,201,933	8,980,912
1929	2,992,898	785,463	285,808	1,817,601	467,077	228,531	158,881	2,210,438	8,946,697
1930	2,981,864	783,629	303,094	1,807,144	433,495	223,889	159,413	2,268,407	8,960,935
1931	2,851,938	697,798	283,547	1,662,397	482,482	212,925	117,819	2,135,789	8,444,695
1932	2,760,367	663,644	240,882	1,715,349	411,935	197,495	86,717	2,213,493	8,289,882

Bureau of Animal Industry. The above figures do not represent production, as a product may be inspected more than once in course of further manufacture.

TABLE 364.—*Meat and meat products: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	2,028,126	465	1,701,510	427	1,552,620	323	1,544,619	348
United States	1,421,054	147,765	1,448,801	217,795	1,183,014	97,765	624,873	51,672
Denmark	640,468	26,692	681,512	28,429	875,694	28,156	1,073,373	28,583
Netherlands	534,982	206,537	458,530	158,485	438,879	175,253	480,221	165,396
New Zealand	442,571	1,102	428,335	1,108	514,668	1,027	519,769	680
Uruguay	396,117	15	371,429	0	409,543	0	----	----
Australia [2]	380,162	6,691	383,319	7,803	344,543	4,212	350,546	7,411
Canada	144,720	27,305	81,528	40,774	35,045	39,835	34,147	13,962
Brazil	131,003	10,511	201,914	6,417	288,230	6,953	184,108	2,786
Irish Free State	105,959	66,964	110,625	59,541	89,190	62,753	95,865	62,267
Poland	71,010	45,836	68,038	55,447	106,227	39,860	189,400	6,585
Sweden	61,961	46,886	63,362	48,848	87,300	60,325	91,085	46,940
China	48,376	3,672	41,082	4,001	43,906	3,563	48,530	1,491
Chile	40,829	4,206	44,991	3,249	41,134	2,131	29,806	----
Hungary	33,182	6,733	19,691	4,285	32,709	5,521	20,093	6,270
Yugoslavia	27,751	9,664	22,364	12,985	15,506	10,264	17,120	8,715
Union of South Africa	24,581	15,656	27,495	15,687	32,102	11,885	23,648	19,567
Rumania	21,049	[3] 1,037	[4] 13,755	[4] 6	[4] 19,093	[4] 4	----	----
Total	6,553,910	627,737	6,169,181	665,377	6,169,461	538,830	5,326,289	422,691
Total:								
Beef	2,872,975	289,592	2,439,639	305,714	2,423,035	235,968	1,972,044	196,242
Pork	2,274,327	150,315	2,272,587	147,749	2,147,775	126,682	2,200,800	70,783
Mutton and lamb	607,310	1,430	633,513	962	735,966	809	695,156	848
Unclassified	799,298	186,400	823,442	210,952	862,685	175,371	458,289	145,818
Total	6,553,910	627,737	6,169,181	665,377	6,169,461	538,830	5,326,289	422,691
PRINCIPAL IMPORTING COUNTRIES								
United Kingdom	127,797	3,827,365	112,301	3,708,244	140,004	3,894,405	115,615	4,217,133
Germany	42,080	838,653	55,142	670,475	78,441	570,656	64,497	463,257
France	62,427	299,085	73,345	176,527	67,603	252,343	58,840	324,484
Italy	18,680	233,627	12,663	230,546	14,482	206,354	17,147	108,851
Belgium	60,122	213,736	30,666	184,702	36,466	195,272	32,592	167,764
Cuba	750	180,592	2,285	168,102	2,231	132,935	----	----
Austria	8,495	124,462	9,915	121,615	9,909	105,188	11,580	92,383
Czechoslovakia	9,837	101,778	10,602	100,048	8,634	83,045	6,332	80,499
Japan	115	68,636	208	70,088	138	71,263	146	76,480
Mexico	7,200	65,814	4,017	2,519	1,135	95,349	93	58,351
Norway	3,107	36,970	3,957	30,705	2,779	28,261	969	21,304
Spain	6,116	31,148	2,719	34,883	5,342	27,323	5,367	32,240
Switzerland	3,383	30,242	3,258	31,468	3,019	30,469	2,829	32,615
Finland	4,565	19,972	1,296	20,245	3,091	13,964	6,294	8,170
Philippine Islands	0	19,812	0	21,607	0	14,845	0	17,204
British Malaya	2,336	15,308	2,249	16,323	1,985	13,628	1,335	11,908
British India	1,254	13,250	1,247	12,813	978	12,819	775	15,047
Peru	590	12,912	1,194	11,029	1,471	6,265	1,342	----
Algeria	1,820	12,557	1,623	12,897	1,377	14,219	887	17,110
Egypt	144	7,603	147	8,599	108	4,689	89	3,592
Total	360,818	6,153,520	337,834	5,633,435	379,373	5,773,292	326,729	5,828,408
Total:								
Beef	126,843	2,696,113	108,387	2,254,053	122,053	2,231,396	108,490	2,180,815
Pork	32,982	2,163,324	27,598	2,093,449	36,185	2,149,631	37,956	2,241,362
Mutton and lamb	4,185	680,356	2,714	702,048	5,848	793,670	3,390	873,971
Unclassified	196,808	613,727	199,135	583,885	215,287	598,595	176,893	529,260
Total	360,818	6,153,520	337,834	5,633,435	379,373	5,773,292	326,729	5,828,408

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] Year ended June 30.
[3] 4-year average.
[4] International Yearbook of Agricultural Statistics.

TABLE 365.—*Hides, packer: Average price per pound at Chicago, 1923–1932*

Calendar year	Steers					Cows			Bulls	
	Heavy native	Heavy Texas	Light Texas	Butt branded	Colorados	Heavy native	Light native	Branded	Native	Branded
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	16.46	14.79	13.77	14.89	13.86	14.21	12.94	11.11	11.69	9.89
1924	14.67	13.82	12.80	13.80	12.79	12.95	12.29	10.41	10.14	8.79
1925	15.96	15.08	14.06	15.16	14.12	14.82	14.62	13.30	11.98	10.29
1926	14.08	13.38	12.67	13.34	12.82	12.71	13.11	12.05	9.98	8.50
1927	19.28	18.21	17.49	18.23	17.74	18.08	18.66	17.26	14.09	12.88
1928	23.85	22.91	22.26	22.95	22.28	22.96	22.63	21.79	17.64	16.02
1929	16.98	16.08	15.16	16.11	15.39	15.86	15.75	14.86	11.42	10.17
1930	13.87	13.76	12.55	13.73	13.18	11.78	11.71	11.19	8.30	7.30
1931	9.06	8.90	8.34	8.96	8.48	8.04	8.43	7.76	5.53	4.78
1932	6.04	5.92	5.14	5.91	5.47	5.17	5.63	5.20	3.86	3.19

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1893–1922, available in 1925 Yearbook, p. 1199, Table 610.

TABLE 366.—*Hides, country: Average price per pound at Chicago, 1923–1932*

Calendar year	Extremes	Heavy steers	Heavy cows	No. 1 buffs	No. 2 buffs	Bulls	Country packer brands	Country brands	No. 1 calfskins	No. 1 kipskins
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	11.65	11.39	10.43	10.45	9.26	8.93	10.12	8.70	17.18	15.42
1924	11.86	11.31	9.24	9.63	8.63	7.86	9.81	8.23	20.39	16.62
1925	14.41	12.94	11.64	12.26	11.25	9.46	12.52	10.54	21.88	18.12
1926	13.46	11.63	9.54	10.70	9.70	8.03	10.52	9.00	18.02	16.12
1927	18.60	16.02	14.85	16.26	15.26	11.49	15.54	13.89	20.47	19.96
1928	22.04	18.53	18.05	19.71	18.71	14.88	19.18	17.38	27.84	25.23
1929	14.98	12.09	11.55	12.82	11.82	8.92	11.88	10.80	20.72	18.72
1930	11.18	8.50	8.40	9.14	8.14	5.90	9.49	7.73	17.43	15.92
1931	7.77	6.02	5.61	6.32	5.32	3.99	6.70	5.05	11.81	10.42
1932	4.88	3.78	3.40	4.15	3.15	2.39	3.32	2.85	6.38	6.28

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1893–1922, available in 1925 Yearbook, p. 1199, Table 610.

TABLE 367.—*Meats and lard: Estimated total production and per capita consumption in United States, 1900–1931*

Calendar year	Production					Per capita consumption					
	Beef	Veal	Lamb and mutton	Pork (excl. lard)	Lard	Beef	Veal	Lamb and mutton	Pork (excl. lard)	Total meats	Lard
	Million pounds	*Million pounds*	*Million pounds*	*Million pounds*	*Million pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1900	5,694	265	517	5,912	1,617	67.8	3.5	6.8	64.7	142.8	13.2
1901	5,919	305	538	5,895	1,614	69.0	3.9	6.9	63.0	142.8	12.9
1902	5,922	346	561	5,334	1,439	68.5	4.4	7.0	57.8	137.7	11.7
1903	6,689	384	582	5,465	1,496	76.0	4.7	7.2	59.3	147.2	11.8
1904	6,548	425	564	5,867	1,596	73.6	5.1	6.8	62.8	148.3	12.4
1905	6,680	455	545	5,748	1,551	73.0	5.4	6.5	58.8	143.7	10.0
1906	6,711	464	555	5,976	1,644	72.6	5.4	6.5	59.7	144.2	11.2
1907	7,192	589	560	6,333	1,777	77.5	6.7	6.4	64.4	155.1	13.5
1908	6,642	573	559	6,617	1,790	71.5	6.4	6.3	66.1	150.3	13.5
1909	7,041	628	603	6,024	1,504	75.4	6.9	6.6	60.1	149.2	11.5
1910	6,703	632	599	5,649	1,434	71.1	6.8	6.4	57.1	141.6	11.4
1911	6,466	597	732	6,596	1,673	67.7	6.4	7.8	64.5	146.5	11.3
1912	5,888	598	779	6,407	1,626	61.1	6.3	8.1	61.8	137.4	11.2
1913	5,881	491	731	6,622	1,681	60.6	5.1	7.5	63.0	136.3	11.4
1914	5,606	443	712	6,530	1,657	58.5	4.6	7.4	62.3	133.0	12.2
1915	5,779	427	622	6,971	1,775	54.5	4.3	6.3	59.5	124.8	12.9
1916	6,075	535	608	7,386	1,849	56.0	5.3	6.1	60.1	127.7	13.6
1917	6,641	661	473	6,139	1,557	59.5	6.5	4.6	49.3	120.1	11.7
1918	7,279	764	493	7,854	1,983	63.0	7.4	4.7	54.8	130.1	13.3
1919	6,758	803	603	7,832	2,039	61.6	7.7	5.8	54.8	130.0	12.3
1920	6,713	797	532	7,455	2,056	63.1	7.6	5.5	60.5	136.8	13.3
1921	6,163	747	626	7,645	2,114	56.9	7.0	5.9	63.5	133.3	11.3
1922	6,706	792	535	8,260	2,357	60.4	7.3	5.0	66.1	138.8	14.2
1923	6,873	862	571	9,595	2,783	61.4	7.7	5.2	74.7	149.0	15.3
1924	7,065	925	589	9,279	2,746	61.6	8.2	5.2	74.7	149.7	15.4
1925	7,146	1,001	599	8,255	2,223	62.2	8.7	5.2	67.6	143.7	13.3
1926	7,458	960	643	8,181	2,324	63.6	8.2	5.5	65.7	143.0	13.5
1927	6,826	867	645	8,533	2,356	58.4	7.4	5.4	68.5	139.7	13.8
1928	6,082	814	671	9,387	2,594	51.7	6.8	5.6	73.9	138.0	14.7
1929	6,065	816	699	9,223	2,598	51.4	6.8	5.8	72.8	136.8	14.3
1930	6,076	833	820	8,809	2,344	50.1	6.8	6.6	69.3	132.8	13.8
1931	6,132	860	878	8,907	2,385	49.6	6.9	7.1	69.6	133.2	14.4

Bureau of Agricultural Economics. Subject to revision.

TABLE 368.—*Horses and mules: Number and value on farms in the United States, January 1, 1910–1933*

Year	Horses			Mules		
	Number	Value per head Jan. 1	Farm value	Number	Value per head Jan. 1	Farm value
	Thousands	*Dollars*	*1,000 dollars*	*Thousands*	*Dollars*	*1,000 dollars*
1910	19, 833	108. 03	2, 142, 524	4, 210	120. 20	506, 049
1911	20, 277	111. 46	2, 259, 981	4, 323	125. 92	544, 359
1912	20, 500	105. 94	2, 172, 694	4, 362	120. 51	525, 657
1913	20, 567	110. 77	2, 278, 222	4, 386	124. 31	545, 245
1914	20, 962	109. 32	2, 291, 638	4, 449	123. 85	551, 017
1915	21, 195	103. 33	2, 190, 102	4, 479	112. 36	503, 271
1916	21, 159	101. 60	2, 149, 786	4, 593	113. 83	522, 834
1917	21, 210	102. 89	2, 182, 307	4, 723	118. 15	558, 006
1918	21, 555	104. 24	2, 246, 970	4, 873	128. 81	627, 679
1919	21, 482	98. 45	2, 114, 897	4, 954	135. 83	672, 922
1920	20, 002	96. 48	1, 938, 447	5, 656	148. 25	838, 530
1921	19, 366	84. 54	1, 637, 181	5, 772	117. 37	677, 475
1922	18, 760	71. 05	1, 332, 822	5, 827	88. 90	518, 558
1923	18, 123	70. 51	1, 277, 873	5, 895	86. 86	512, 007
1924	17, 365	65. 42	1, 135, 967	5, 908	85. 89	507, 435
1925	16, 640	64. 28	1, 069, 654	5, 918	82. 91	490, 668
1926	16, 067	65. 32	1, 049, 442	5, 903	81. 51	481, 153
1927	15, 368	63. 74	979, 509	5, 801	74. 50	432, 181
1928	14, 768	66. 68	984, 763	5, 647	79. 79	450, 585
1929	14, 203	69. 63	988, 953	5, 496	82. 39	452, 825
1930	13, 684	69. 86	955, 964	5, 366	83. 76	449, 480
1931	13, 169	60. 42	795, 725	5, 226	69. 19	361, 562
1932	12, 641	53. 37	674, 611	5, 089	60. 64	308, 617
1933 [1]	12, 163	54. 15	658, 684	4, 981	60. 31	300, 391

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 369.—*Horses: Price per head received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	81	85	85	86	88	87	85	83	82	80	78	75	82
1924	73	74	75	76	78	77	77	79	78	77	76	73	76
1925	73	78	81	83	82	81	81	80	77	76	75	74	78
1926	75	80	82	84	84	83	82	80	78	77	75	73	79
1927	73	77	79	80	81	80	80	80	78	76	75	75	78
1928	77	82	85	85	86	86	85	84	82	80	79	78	82
1929	77	79	83	85	85	84	84	82	82	79	78	77	81
1930	77	77	78	79	79	77	73	70	69	68	66	64	75
1931	65	67	69	69	69	67	64	62	60	58	57	56	65
1932	56	58	62	63	62	61	61	61	59	57	57	56	60

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number of horses Jan. 1, to obtain a price for the United States; yearly prices obtained by weighting monthly prices by receipts at public stockyards.

TABLE 370.—*Mules: Price per head received by producers, United States, 1926–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1926	92	96	97	100	99	99	96	95	94	90	85	85	94
1927	83	88	91	92	91	92	91	90	90	90	91	91	90
1928	93	97	100	102	102	102	101	100	96	96	94	93	96
1929	94	96	99	101	101	100	99	96	96	96	94	93	96
1930	93	94	95	96	95	94	88	80	78	78	77	74	91
1931	74	76	78	80	79	77	73	70	67	65	65	63	74
1932	63	65	68	70	68	67	66	66	66	65	63	61	66

Bureau of Agricultural Economics. Based on returns of special price reporters. Monthly prices by States, weighted by number of mules Jan. 1, to obtain a price for the United States.

TABLE 371.—*Horses, horse colts, mules and mule colts: Estimated number on farms and value per head, by States, January 1, 1931–1933*

State and division	Horses						Mules					
	Number			Value per head [1]			Number			Value per head [1]		
	1931	1932	1933 [2]	1931	1932	1933	1931	1932	1933 [2]	1931	1932	1933
	Thousands	*Thousands*	*Thousands*	*Dolls.*	*Dolls.*	*Dolls.*	*Thousands*	*Thousands*	*Thousands*	*Dolls.*	*Dolls.*	*Dolls.*
Maine	59	55	52	115.00	114.00	104.00						
New Hampshire	19	18	17	113.00	95.00	90.00						
Vermont	51	48	46	109.00	102.00	90.00						
Massachusetts	24	23	22	133.00	108.00	101.00						
Rhode Island	4	4	4	135.00	100.00	90.00						
Connecticut	21	20	19	137.00	110.00	92.00						
New York	312	303	300	115.00	107.00	97.00	6	6	6	127.00	102.00	91.00
New Jersey	37	35	33	112.00	102.00	96.00	3	3	2	130.00	119.00	90.00
Pennsylvania	309	297	285	108.00	104.00	95.00	50	50	51	117.00	111.00	98.00
North Atlantic	836	803	778	113.03	105.65	95.95	59	59	59	118.68	110.49	97.29
Ohio	484	469	460	93.00	87.00	87.00	32	32	33	94.00	89.00	88.00
Indiana	438	425	412	76.00	73.00	72.00	86	83	81	83.00	77.00	77.00
Illinois	805	773	742	69.00	60.00	60.00	132	129	126	79.00	69.00	67.00
Michigan	381	373	366	98.00	97.00	97.00	6	6	6	93.00	89.00	91.00
Wisconsin	538	522	512	91.00	77.00	77.00	7	7	7	79.00	74.00	74.00
East North Central	2,646	2,562	2,492	83.20	75.95	75.89	263	257	253	82.45	74.68	73.93
Minnesota	791	775	760	71.00	56.00	57.00	15	15	15	74.00	63.00	59.00
Iowa	1,037	996	955	68.00	56.00	50.00	83	81	79	76.00	64.00	63.00
Missouri	592	574	551	45.00	40.00	45.00	297	291	288	64.00	55.00	60.00
North Dakota	604	586	551	44.00	41.00	46.00	8	8	8	49.00	45.00	50.00
South Dakota	605	581	552	45.00	36.00	39.00	18	18	17	66.00	46.00	47.00
Nebraska	719	697	676	52.00	44.00	46.00	95	91	88	62.00	57.00	56.00
Kansas	699	664	631	38.00	37.00	41.00	155	150	146	58.00	52.00	52.00
West North Central	5,047	4,873	4,676	53.71	45.62	48.71	671	654	641	63.65	55.52	57.59
North Central	7,693	7,435	7,168	63.85	56.07	58.16	934	911	894	68.94	60.92	62.21
Delaware	17	16	16	82.00	64.00	64.00	10	10	9	100.00	93.00	86.00
Maryland	93	91	89	83.00	68.00	68.00	29	28	28	105.00	95.00	89.00
Virginia	195	187	178	68.00	60.00	66.00	94	93	90	85.00	84.00	83.00
West Virginia	112	106	101	79.00	70.00	74.00	13	12	12	83.00	74.00	73.00
North Carolina	83	77	75	76.00	65.00	67.00	276	270	265	114.00	89.00	89.00
South Carolina	28	25	23	69.00	54.00	63.00	176	167	164	92.00	74.00	77.00
Georgia	36	35	33	63.00	52.00	50.00	340	333	326	87.00	70.00	69.00
Florida	20	19	18	77.00	67.00	59.00	42	42	42	106.00	97.00	74.00
South Atlantic	584	556	533	74.09	65.51	66.62	980	955	936	96.74	79.65	78.36
Kentucky	241	231	224	51.00	47.00	47.00	257	254	257	64.00	59.00	59.00
Tennessee	169	157	146	56.00	49.00	49.00	321	318	315	73.00	67.00	64.00
Alabama	62	58	55	51.00	46.00	45.00	322	319	322	74.00	62.00	65.00
Mississippi	98	92	86	45.00	43.00	39.00	358	347	347	66.00	63.00	58.00
Arkansas	133	128	125	32.00	31.00	35.00	342	332	319	48.00	46.00	51.00
Louisiana	112	106	104	46.00	38.00	32.00	197	189	180	74.00	63.00	56.00
Oklahoma	482	453	439	33.00	30.00	33.00	302	287	276	47.00	43.00	46.00
Texas	741	704	676	35.00	30.00	31.00	990	960	922	54.00	47.00	47.00
South Central	2,038	1,929	1,855	39.54	35.19	35.88	3,089	3,006	2,938	60.21	54.08	54.00
Montana	430	400	380	27.00	23.00	24.00	9	8	8	44.00	29.00	29.00
Idaho	198	190	180	44.00	36.00	35.00	7	7	7	51.00	45.00	36.00
Wyoming	171	162	154	34.00	26.00	26.00	4	4	4	48.00	45.00	41.00
Colorado	331	324	318	41.00	34.00	31.00	28	27	26	52.00	42.00	39.00
New Mexico	135	130	125	28.00	23.00	26.00	23	22	21	39.00	39.00	37.00
Arizona	77	74	72	43.00	41.00	40.00	12	12	12	66.00	58.00	39.00
Utah	90	87	83	54.00	38.00	46.00	3	3	3	54.00	35.00	40.00
Nevada	39	38	36	48.00	46.00	45.00	3	3	3	47.00	44.00	41.00
Washington	171	161	151	55.00	49.00	48.00	21	20	20	55.00	54.00	55.00
Oregon	169	162	154	53.00	44.00	47.00	14	14	14	51.00	49.00	50.00
California	207	190	176	69.00	59.00	54.00	40	38	36	78.00	67.00	56.00
Western	2,018	1,918	1,829	42.70	35.75	35.59	164	158	154	57.21	50.41	45.71
United States	13,169	12,641	12,163	60.42	53.37	54.15	5,226	5,089	4,981	69.19	60.64	60.31

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Sum of total value of subgroups (classified by age), divided by total number and rounded to nearest dollar for States. Division and United States averages not rounded.

[2] Preliminary.

TABLE 372.—*Horses, mules, and asses in specified countries, average 1921–1925, annual 1930–31*

Country	Month of estimate	Horses: Average, 1921–1925 [1]	Horses: 1930	Horses: 1931	Mules: Average, 1921–1925 [1]	Mules: 1930	Mules: 1931	Asses: Average, 1921–1925 [1]	Asses: 1930	Asses: 1931
		Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
North America, Central America, and West Indies:										
United States—										
On farms	Jan. 1	18,051	13,684	13,169	5,864	5,366	5,226	[2] 72	[2,3] 48	
Not on farms		[3,4] 1,706			[2,4] 378			[2,4] 15		
Canada	June	3,627	3,295	3,129						
Mexico		447	[2] 743		322	[2] 305		521	[2] 1,532	
Guatemala	July	70	63					[5] (30)	[5] 37	
Costa Rica		105	[6] 85		9	[6] 8				
Cuba	Jan. 1 [7]	844	758	634	74	92	90			
Dominican Republic	April	136			44			122		
Haiti		(110)	[6] 125		(23)	[6] 25		(150)	[6] 240	
Puerto Rico	Jan. 1	[2,4] 57	[2,3] 50		[2,4] 7	[2,3] 6		[2,4] 1	[2,3] 2	
Estimated total [8]		25,400			6,800			1,000		
South America:										
Colombia		971	929		354	329		149	149	
Venezuela		168			55			200		
Ecuador		85	(85)					[6] (15)		
Peru		156	[2,6] 432		(130)	[2,6] 130		(265)	[2,6] 265	
Bolivia	Jan. 1 [7]	(150)	376		(150)			185		
Chile		482	[2] 441		42	[2] 31		30	[2] 37	
Brazil	September	[2,4] 5,254		[9] 5,750				[2,5] 1,865		[2,9] 2,040
Uruguay		[2] 613	[2] 500							
Paraguay	Jan. 1 [7]	[10] 400			[10] 19			[10] 20		
Argentina	do. [7]	9,432	[2,11] 9,858		623	[2,11] 660		259	[2,11] 377	
Estimated total [3]		17,800			1,300			3,000		
Europe:										
England and Wales	June	1,280	961	938						
Scotland	do.	202	157	153						
North Ireland	do.	[12] 98	[12] 87	[12] 86	[14]	[14]	[14]	[14]	[14]	[14]
Irish Free State	do.	[12] 332	[12] 325	[12] 326	[14]	16	16	210	183	177
Ireland, total		[12] 430	[12] 412	[12] 412	25	17	16	224	191	195
Norway	June	188	177	177						
Sweden	July	[11] 728	653	658						
Denmark	do.	564	494	499						
Netherlands	May–June	[2] 364	[2] 299							
Belgium	Jan. 1 [7]	230	249	246						

See footnotes at end of table.

TABLE 372.—*Horses, mules, and asses in specified countries, average 1921–1925, annual 1930–31*—Continued

Country	Month of estimate	Horses: Average, 1921–1925[1]	Horses: 1930	Horses: 1931	Mules: Average, 1921–1925[1]	Mules: 1930	Mules: 1931	Asses: Average, 1921–1925[1]	Asses: 1930	Asses: 1931
		Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Europe—Continued.										
France	Jan. 1[7]	2,765	2,986	2,924	188	143	154	290	234	252
Spain	do.[7]	634	[2,14] 598	563	1,129	[2,14] 1,154	1,175	1,067	[2,14] 1,008	1,004
Portugal	October–March	80			88			236		
Italy	March	1,008	[2] 974		500	[2] 464		969	[2] 870	
Switzerland	April	134	[2] 140		4		[5] 4	1		[5] 1
Germany	Jan. 1[7]	3,690	3,617	3,522	(15)	(15)	(15)	[5] 32	[5] 21	[5] 19
Austria	do.[7]	268	[2] 248		[2,16] 1	[2,14] 2		(17)	(17)	
Czechoslovakia	do.[7]	591	[2,14] 750	748	[2] 2	[2,14] 1	1	[2] 2	[2,14] 1	1
Hungary	Spring or summer	814	860	865	2	1	1	5	4	4
Yugoslavia	January	1,067	1,140	1,161	28	15	16	87	106	107
Greece	Jan. 1[7]	208	323	317	128	148	154	250	381	343
Bulgaria	do.[7]	[2] 342			26			122		
Work animals only	January[7]	198	258							
Rumania	Jan. 1[7]	1,729	1,867	1,809	3	1	1	10	9	12
Poland	November	3,290	4,103	4,124						
Lithuania	Spring	470	597	592						
Latvia	do.	324	359	368						
Estonia	Spring or summer	210	204	207						
Finland	September	399	[5] 349							
Russia, European and Asiatic	Spring	24,611	30,768							
Estimated total[8]		22,200			2,200			3,500		
Africa:										
Morocco		174	206		64	100		490	576	
Algeria	March	161	173	167	213	169	169	207	302	305
Tunis	Jan. 1[7]	73	89	95	31	41	44	138	161	180
French West Africa and French Sudan		148	240					334	577	
Nigeria, including British Cameroons		173	184					476	278	
Egypt	September	35	36		21	21		653	763	
Union of South Africa	April–August	925	868		131	141		780	740	
Basutoland		166	137		1			6	10	
Kenya Colony		2	2	2	1	1		34	216	
Anglo-Egyptian Sudan		17	22					296	351	
Eritrea		2			10			47		
French Equatorial Africa		49						47	57	
British Southwest Africa	Jan. 1[7]	22	21	19	2	2	2	36	61	61
Rhodesia, Southern		3	3	3	(15)	(15)	(15)	25	50	

Tanganyika Territory								24	51	
Estimated total [8]		2,000			500			3,700		
Asia:										
Cyprus		4	5	5	9	9	9	45	54	
Turkey, European and Asiatic	Summer	452	464		91	37		556	861	
Persia		[9, 16] 1,500								
India—										
British	December-April	1,747	[3] 1,701		75	[3] 75		1,382	[3] 1,380	
Native States	do	502	[3] 557		6	8		348	[3] 441	
China, including Manchuria and Turkestan		[18] 4,000			[18] 5,100					
Kwantung	Jan. 1 [7]	8	8	8	16	22	23	29	29	27
Syria and Lebanon	December-April	42	52		20	23		91	115	
Japan	Jan. 1 [7]	1,545	1,490	1,490						
French Indo-China		107	97		2	2	2			
Siam	Mar. 31	183	293							
Philippine Islands [14]	Jan. 1 [7]	281	341	344						
Dutch East Indies—										
Java and Madura	do. [7]	273	252	249						
Outer possessions	January [7]	443	456	432						
Estimated total [8]		12,100			5,400			2,500		
Oceania:										
Australia	Jan. 1 [7]	2,373	1,846	1,793	4	4	4	12	10	10
New Zealand	Jan. 31	328	297	296						
Estimated total [8]		2,700								
Total all countries reported for period 1921-1925 and 1930, including Russia [19]		91,781	94,807		10,141	9,554		10,452	12,503	
To 1931, excluding Russia [20]		44,450	43,227	42,114	7,720	7,187	7,087	2,389	2,516	2,510
Estimated world total [8]		106,800			16,200			13,700		

Bureau of Agricultural Economics. Compiled from official sources and the International Institute of Agriculture, unless otherwise stated.

[1] Average for 5-year period if available, otherwise for any year or years within this period, except as otherwise stated. Figures in parentheses interpolated. For annual figures 1926 to 1930 see Yearbook for 1932.
[2] Census.
[3] April.
[4] 1920.
[5] Includes mules.
[6] 1929.
[7] Estimates for countries reporting as of December have been considered as of Jan. 1 of the following year; i. e., the number of animals as reported in France as of Dec. 31, 1929, have been placed in the 1930 column.
[8] Includes interpolations for a few countries not reporting each year and rough estimates for some others.
[9] Unofficial.
[10] 1918.
[11] June.
[12] Incomplete. Refers to horses used in agriculture only.
[13] Included with data for total Ireland.
[14] May.
[15] Included with asses.
[16] Includes mules and asses.
[17] Included with mules.
[18] Estimate based on figures for 20 Provinces which supported over 80 per cent of total in China in 1914.
[19] Comparable totals for the following number of countries reporting for the 5-year average, 1921-1925 and 1930: Horses, 68 countries; mules 36 countries; asses 40 countries.
[20] Comparable totals for the following number of countries reporting for the 5-year average 1921-1925, 1930, and 1931. Horses, 36 countries; mules, 17 countries; asses, 14 countries.

DAIRY AND POULTRY STATISTICS

TABLE 373.—*Milk cows: Numbers and value per head in the United States, 1880–1933*

Year	Milk cows on farms		Year	Milk cows on farms		Year	Milk cows on farms	
	Number[1]	Value per head Jan. 1[2]		Number[1]	Value per head Jan. 1[2]		Number[1]	Value per head Jan. 1[2]
	Thousands	*Dollars*		*Thousands*	*Dollars*		*Thousands*	*Dollars*
1880[3]	*12,443*	------	1899	15,990	29.06	1918	21,021	67.37
1880	12,027	23.27	1900[3]	*17,136*	------	1919	21,219	74.68
1881	12,369	23.95	1900	15,253	30.18	1920[3]	*19,675*	------
1882	12,612	25.89	1901	15,521	28.65	1920	21,455	81.51
1883	13,126	30.21	1902	15,787	27.91	1921	21,440	61.20
1884	13,501	31.37	1903	16,073	28.85	1922	21,822	48.69
1885	13,905	29.70	1904	16,459	27.90	1923	22,099	46.68
1886	14,235	27.40	1905	16,842	26.21	1924	22,288	49.94
1887	14,522	26.08	1906	17,277	28.12	1925[3]	*20,900*	------
1888	14,856	24.65	1907	17,650	29.60	1925	22,505	48.38
1889	15,299	23.94	1908	17,937	29.29	1926	22,311	54.73
1890[3]	*16,512*	------	1909	18,154	30.90	1927	22,159	59.24
1890	15,953	22.14	1910[3]	*20,625*	------	1928	22,129	73.47
1891	16,020	21.62	1910	18,206	33.70	1929	22,330	83.99
1892	16,416	21.40	1911	18,244	38.17	1930[3]	*21,124*	------
1893	16,424	21.75	1912	18,312	37.62	1930	22,910	82.80
1894	16,487	21.77	1913	18,526	42.99	1931	23,576	57.10
1895	16,505	21.97	1914	18,930	51.51	1932	24,469	39.57
1896	16,138	22.55	1915	19,526	52.84	1933[4]	25,136	29.15
1897	15,942	23.16	1916	20,064	51.49			
1898	15,841	27.45	1917	20,541	56.95			

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Prior to 1900, estimates for each 10-year period represent an index of annual changes applied to the census as a base on first report after census data were available. Figures for 1900 to 1919 are tentatively revised estimates of the Bureau of Agricultural Economics for numbers on Jan. 1. Figures from 1920 to 1931 are revised estimates made in 1932, based upon study of 1930 census report. Figures 1900 to 1933 relate to "cows and heifers 2 years old and over Jan. 1, kept for milk."

[2] Values for 1880–1899 relate to "milk cows." Data for 1900–1925 are an old series of values of "milk cows" adjusted to relate to "milk cows and heifers, 2 years old and over" on basis of relationship between the 2 series from 1926 to 1928. Conversion factor was 0.955 (base is old series). Data for 1926–1933 are values relating to "milk cows and heifers 2 years old and over."

[3] Italic figures are from the census. Figures for census years 1880 and 1890 represent "milk cows"; 1900, "cows kept for milk 2 years and over"; 1910 "cows and heifers kept for milk, born before Jan. 1, 1909" (15½ months and over); 1920 "dairy cattle 2 years old and over kept mainly for milk production"; 1925 and 1930, "number of cows milked in 1924 and 1929." Census dates were June 1 from 1880 to 1900; Apr. 15, 1910; Jan. 1, 1920 and 1925; Apr. 1, 1930.

[4] Preliminary.

TABLE 374.—*Milk cows, heifers, and heifer calves: Estimated number on farms, by States, January 1, 1931–1933*

State and division	Cows and heifers, 2 years old and over, kept for milk						Heifers 1 to 2 years old being kept for milk cows			Heifer calves under 1 year being kept for milk cows		
	Number			Value per head								
	1931	1932	1933 [1]	1931	1932	1933 [1]	1931	1932	1933 [1]	1931	1932	1933 [1]
	Thousands	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Maine	140	146	148	70.00	50.00	36.00	39	40	41	43	42	41
New Hampshire	79	81	79	90.00	61.00	46.00	18	18	19	19	20	19
Vermont	288	294	294	79.00	52.00	40.00	59	58	59	58	60	61
Massachusetts	131	134	132	122.00	88.00	64.00	20	20	21	21	22	23
Rhode Island	21	21	21	123.00	90.00	68.00	3	3	3	4	4	4
Connecticut	108	114	115	110.00	83.00	60.00	19	18	18	19	19	19
New York	1,370	1,411	1,438	86.00	61.00	49.00	237	213	221	218	225	243
New Jersey	119	120	122	125.00	89.00	63.00	17	16	17	16	19	22
Pennsylvania	860	886	904	80.00	60.00	42.00	165	155	153	160	158	161
North Atlantic	3,116	3,207	3,253	87.16	62.55	47.22	577	541	552	558	569	593
Ohio	910	938	966	59.00	44.00	32.00	189	182	178	188	180	192
Indiana	722	751	774	53.00	39.00	29.00	140	140	136	145	144	150
Illinois	1,057	1,089	1,111	64.00	42.00	32.00	234	215	219	215	225	235
Michigan	825	850	867	62.00	45.00	33.00	169	160	157	165	163	160
Wisconsin	2,096	2,150	2,175	64.00	43.00	30.00	402	409	380	412	412	410
East North Central	5,610	5,778	5,893	61.48	42.75	31.01	1,143	1,106	1,070	1,125	1,124	1,147
Minnesota	1,643	1,708	1,742	56.00	35.00	25.00	341	335	318	340	365	373
Iowa	1,414	1,471	1,503	50.00	38.00	27.00	300	285	288	295	290	293
Missouri	989	1,030	1,040	44.00	30.00	23.00	205	198	190	205	200	195
North Dakota	567	624	654	50.00	33.00	25.00	120	128	131	122	139	153
South Dakota	589	607	619	52.00	31.00	24.00	138	138	142	154	154	150
Nebraska	680	700	714	56.00	36.00	27.00	131	126	127	130	127	127
Kansas	811	843	868	48.00	33.00	25.00	143	147	147	155	162	165
West North Central	6,693	6,983	7,140	53.03	34.23	25.24	1,378	1,357	1,343	1,401	1,427	1,462
North Central	12,303	12,761	13,033	56.88	38.09	27.85	2,521	2,463	2,413	2,526	2,551	2,614
Delaware	33	35	36	80.00	54.00	36.00	6	5	5	5	4	4
Maryland	184	186	188	75.00	49.00	35.00	32	28	26	28	26	28
Virginia	383	394	406	43.00	35.00	27.00	56	54	49	56	53	58
West Virginia	214	218	222	47.00	37.00	29.00	31	29	31	34	35	37
North Carolina	290	309	328	48.00	37.00	28.00	64	66	66	70	70	75
South Carolina	140	145	154	46.00	33.00	27.00	30	30	29	29	30	32
Georgia	329	342	356	36.00	25.00	19.00	80	86	87	82	88	92
Florida	86	90	93	47.00	38.00	29.00	14	16	18	15	15	18
South Atlantic	1,668	1,719	1,783	47.75	35.51	26.97	313	314	311	319	321	344
Kentucky	508	528	544	40.00	30.00	23.00	82	70	70	80	83	87
Tennessee	487	507	527	39.00	28.00	21.00	98	93	86	98	95	100
Alabama	371	390	413	33.00	23.00	18.00	100	104	99	108	114	131
Mississippi	455	496	526	30.00	21.00	15.00	81	84	76	85	87	95
Arkansas	383	421	454	27.00	23.00	18.00	92	100	95	106	108	110
Louisiana	247	260	270	36.00	30.00	21.00	51	54	54	56	58	60
Oklahoma	682	716	766	36.00	27.00	20.00	138	145	154	174	175	186
Texas	1,238	1,312	1,391	36.00	29.00	20.00	228	223	223	259	259	260
South Central	4,371	4,630	4,891	35.13	26.84	19.60	870	873	857	966	979	1,028
Montana	193	195	195	55.00	36.00	32.00	39	40	45	44	46	46
Idaho	187	194	198	65.00	39.00	31.00	50	53	55	53	54	57
Wyoming	72	72	73	65.00	39.00	31.00	15	15	16	16	17	18
Colorado	260	266	269	56.00	36.00	25.00	57	59	60	68	70	71
New Mexico	69	70	71	50.00	37.00	25.00	15	15	16	17	17	18
Arizona	40	42	45	78.00	57.00	39.00	10	11	12	11	12	13
Utah	111	111	112	62.00	36.00	32.00	28	28	28	29	29	28
Nevada	21	21	21	70.00	51.00	38.00	6	6	6	7	7	7
Washington	288	300	312	68.00	53.00	36.00	65	65	70	70	70	74
Oregon	240	250	255	61.00	45.00	31.00	55	57	58	58	58	60
California	637	631	625	79.00	51.00	38.00	154	145	142	145	145	143
Western	2,118	2,152	2,176	66.80	44.77	33.16	494	494	508	518	525	535
United States	23,576	24,469	25,136	57.10	39.57	29.15	4,775	4,685	4,641	4,887	4,945	5,109

Bureau of Agricultural Economics. Estimates of Crop Reporting Board. Revisions by States, 1920–1927, except for heifer calves, are published in February, 1932, Crops and Markets.

[1] Preliminary.

TABLE 375.—*Heifers and heifer calves: Estimated number on farms, United States, January 1, 1920–1933*

Year	Heifers 1 to 2 years old being kept for milk cows	Heifer calves under 1 year being kept for milk cows	Year	Heifers 1 to 2 years old being kept for milk cows	Heifer calves under 1 year being kept for milk cows	Year	Heifers 1 to 2 years old being kept for milk cows	Heifer calves under 1 year being kept for milk cows
	Thousands	*Thousands*		*Thousands*	*Thousands*		*Thousands*	*Thousands*
1920	4,420		1925	4,171	4,274	1930	4,700	5,005
1921	4,164		1926	4,045	4,276	1931	4,775	4,887
1922	3,972		1927	4,048	4,383	1932	4,065	4,945
1923	4,155		1928	4,158	4,606	1933 [1]	4,641	5,109
1924	4,143	4,426	1929	4,404	4,911			

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Preliminary.

TABLE 376.—*Purebred dairy cattle: Number registered, each year, by breeds, United States, 1921–1932*

Year	Ayrshire			Guernsey			Holstein-Friesian			Jersey		
	Bulls	Cows	Total	Bulls	Cows	Total	Bulls	Cows	Total	Bulls	Cows	Total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
1923	1,578	5,975	7,553	9,758	16,976	26,734	29,089	86,043	115,132	12,291	38,159	50,450
1924	1,431	5,508	6,939	10,301	18,166	28,467	28,209	83,320	111,529	12,331	39,832	52,163
1925	1,561	5,972	7,533	11,299	20,742	32,041	26,935	82,659	109,594	12,131	41,725	53,856
1926	1,720	6,142	7,862	12,392	22,298	34,690	28,117	82,971	111,088	12,837	42,915	55,752
1927	1,847	6,554	8,401	12,777	22,694	35,471	28,817	81,146	109,963	15,666	48,411	64,077
1928	2,274	7,837	10,111	14,363	24,664	39,027	33,512	88,214	121,726	19,393	54,516	73,909
1929	2,586	8,833	11,419	14,661	26,288	40,949	35,438	89,927	125,365	19,230	52,431	71,661
1930	2,050	8,159	10,209	15,810	28,662	44,472	29,242	75,901	105,143	14,350	43,767	58,117
1931	1,552	7,324	8,876	12,880	27,964	40,844	21,811	70,535	92,346	10,262	38,211	48,473
1932	1,317	6,306	7,623	[1] 9,962	25,817	35,779	13,834	54,481	68,315	7,678	33,551	41,229

Bureau of Agricultural Economics. Obtained from registry associations. See 1930 Yearbook, Table 41, p. 901, and 1932 for data for earlier years.

[1] Year ended Apr. 1.

TABLE 377.—*Cattle: Tuberculin testing under accredited-herd and area plans, 1923–1932*

Year ended June 30	Cattle tested					Modified accredited counties	Herds accredited [1]	Herds passed one test [1]	Herds under supervision [1]
	Accredited herd plan	Area plan	Total	Reactors found					
	Number	*Number*	*Number*	*Number*	*Per cent*	*Number*	*Number*	*Number*	*Number*
1923	1,695,662	1,765,187	3,460,849	113,844	3.3		12,310	150,748	187,915
1924	1,865,863	3,446,501	5,312,364	171,559	3.2	38	19,747	216,737	305,809
1925	2,008,526	4,991,502	7,000,028	214,491	3.1	51	24,110	392,740	414,620
1926	1,989,048	6,661,732	8,650,780	323,084	3.7	109	24,009	382,674	435,640
1927	2,522,791	7,177,385	9,700,176	285,361	2.9	149	34,084	229,086	201,148
1928	2,589,844	8,691,646	11,281,490	262,113	2.3	180	38,880	427,595	473,218
1929	2,853,633	8,830,087	11,683,720	206,764	1.8	213	1,639	249,420	281,323
1930	2,953,350	9,892,521	12,845,871	216,932	1.7	236	11,863	227,921	347,448
1931	3,086,403	10,695,870	13,782,273	203,778	1.5	247	[2] −26,259	350,735	356,916
1932	3,131,426	10,312,131	13,443,557	254,785	1.9	220	18,049	282,988	303,632

Bureau of Animal Industry. Current data on tuberculosis-eradication work, including progress by States and counties, may be obtained from Bureau of Animal Industry.

[1] The figures in these columns represent net increases at the close of each year.
[2] Represents decrease from figures for previous year.

TABLE 378.—*Milk cows and production of milk: Estimated number of producing cows, yield per cow, and production of milk by States, 1929–1932*

State and division	Milk cows on farms [1]				Milk production per cow [2]				Total production of milk on farms [2]			
	1929	1930	1931	1932 [3]	1929	1930	1931	1932 [3]	1929	1930	1931	1932 [3]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*
Maine	130	132	136	140	4,800	4,970	4,770	4,620	624	656	649	647
New Hampshire	71	73	76	76	5,070	5,090	4,920	4,900	360	372	374	372
Vermont	259	264	272	275	4,720	4,890	4,910	4,800	1,222	1,291	1,336	1,320
Massachusetts	126	125	126	126	5,920	5,990	5,870	5,710	746	749	740	719
Rhode Island	20	21	21	21	6,400	6,350	6,300	6,300	128	133	132	132
Connecticut	98	101	106	110	5,730	5,770	5,630	5,660	562	583	597	623
New York	1,265	1,290	1,334	1,370	5,512	5,480	5,521	5,357	6,973	7,068	7,367	7,340
New Jersey	113	114	115	116	6,300	6,130	6,130	5,900	712	699	705	684
Pennsylvania	808	828	852	877	5,250	5,220	5,210	4,980	4,242	4,322	4,439	4,367
North Atlantic	2,890	2,948	3,038	3,111	5,387	5,384	5,378	5,209	15,569	15,873	16,339	16,204
Ohio	850	866	883	912	4,750	4,650	4,670	4,470	4,038	4,027	4,124	4,077
Indiana	670	682	705	731	4,440	4,260	4,290	4,160	2,975	2,905	3,024	3,041
Illinois	964	1,000	1,027	1,054	4,650	4,650	4,550	4,510	4,483	4,650	4,673	4,754
Michigan	760	778	801	822	5,300	5,160	5,200	5,100	4,028	4,014	4,165	4,192
Wisconsin	1,890	1,973	2,037	2,074	5,850	5,680	5,550	5,300	11,056	11,207	11,305	10,992
East North Central	5,134	5,299	5,453	5,593	5,177	5,058	5,005	4,837	26,580	26,803	27,291	27,056
Minnesota	1,480	1,524	1,577	1,627	5,050	4,980	4,900	4,800	7,474	7,590	7,727	7,810
Iowa	1,310	1,323	1,358	1,406	4,480	4,480	4,380	4,300	5,869	5,927	5,948	6,046
Missouri	885	938	986	1,012	3,750	3,700	3,680	3,540	3,319	3,471	3,628	3,582
North Dakota	500	521	560	602	4,150	4,150	4,050	3,750	2,075	2,162	2,268	2,258
South Dakota	520	532	545	560	4,100	4,150	4,000	3,580	2,132	2,208	2,180	2,005
Nebraska	640	642	653	672	4,170	4,370	4,300	4,100	2,669	2,806	2,808	2,755
Kansas	735	757	788	817	4,050	4,040	4,080	4,000	2,977	3,058	3,215	3,268
West North Central	6,070	6,237	6,467	6,696	4,368	4,365	4,295	4,140	26,515	27,222	27,774	27,724
Delaware	31	31	32	33	4,200	4,000	4,050	3,950	130	124	130	130
Maryland	172	175	177	180	4,550	4,300	4,350	4,250	783	752	770	765
Virginia	355	362	370	381	3,770	3,320	3,520	3,360	1,338	1,202	1,302	1,280
West Virginia	196	202	206	210	3,800	3,600	3,690	3,560	752	727	760	748
North Carolina	273	279	290	304	3,950	3,770	3,750	3,660	1,078	1,052	1,088	1,113
South Carolina	135	133	135	141	3,450	3,490	3,550	3,450	466	464	479	486
Georgia	300	307	316	328	3,370	3,270	3,170	3,080	1,011	1,004	1,002	1,010
Florida	80	81	83	86	2,930	2,730	2,830	2,770	234	221	235	238
South Atlantic	1,544	1,570	1,609	1,663	3,751	3,532	3,584	3,470	5,792	5,546	5,766	5,770
Kentucky	490	487	502	522	3,840	3,590	3,540	3,440	1,882	1,748	1,777	1,796
Tennessee	442	455	474	496	3,680	3,500	3,390	3,240	1,627	1,592	1,607	1,607
Alabama	340	348	363	384	3,230	3,100	3,030	3,000	1,098	1,079	1,100	1,152
Mississippi	400	418	450	484	2,930	2,900	2,860	2,740	1,172	1,212	1,287	1,326
Arkansas	342	349	373	406	3,350	3,130	3,130	3,000	1,146	1,092	1,167	1,218
Louisiana	220	224	234	244	2,450	2,290	2,250	2,230	539	513	526	544
Oklahoma	612	637	669	710	3,650	3,480	3,500	3,450	2,234	2,217	2,342	2,450
Texas	1,100	1,135	1,187	1,261	3,370	3,220	3,250	3,180	3,707	3,655	3,858	4,010
South Central	3,946	4,053	4,252	4,507	3,397	3,234	3,214	3,129	13,405	13,108	13,664	14,103
Montana	180	181	182	183	4,350	4,380	4,050	3,990	783	793	737	730
Idaho	168	174	181	186	5,550	5,750	5,580	5,440	932	1,000	1,010	1,012
Wyoming	68	68	68	69	4,340	4,140	4,040	3,790	295	282	275	262
Colorado	243	244	247	251	4,500	4,450	4,300	4,000	1,094	1,086	1,062	1,004
New Mexico	65	65	66	67	3,400	3,400	3,400	3,300	221	221	224	221
Arizona	36	38	39	42	5,200	5,100	5,000	4,640	187	194	195	195
Utah	102	105	107	107	5,650	5,480	5,400	5,300	576	575	578	567
Nevada	20	21	21	21	5,500	5,500	5,130	4,880	110	116	108	102
Washington	265	274	283	295	6,000	6,070	5,900	5,680	1,590	1,663	1,670	1,676
Oregon	220	230	240	247	5,450	5,500	5,380	5,200	1,199	1,265	1,291	1,284
California	610	609	604	599	6,450	6,550	6,600	6,600	3,934	3,989	3,986	3,953
Western	1,977	2,009	2,038	2,067	5,524	5,567	5,464	5,325	10,921	11,184	11,136	11,006
United States	21,561	22,116	22,857	23,637	4,582	4,510	4,461	4,309	98,736	99,705	101,970	101,863

Bureau of Agricultural Economics. Estimates of Division of Crop and Livestock Estimates.

[1] Average number of milk cows on farms during year, excluding heifers not fresh.
[2] Excluding milk spilled or wasted on farms and milk sucked by calves.
[3] Preliminary.

TABLE 379.—*Milk and butterfat produced and milk used for each purpose on farms, 1932*

State and division	Milk cows on farms [1]	Estimated production per milk cow during year [2]: Milk	Estimated production per milk cow during year [2]: Butterfat	Percentage of butterfat in milk produced	Total production on farms [2]: Milk	Total production on farms [2]: Butterfat	Disposition of milk: Used as whole milk or cream on farms where produced	Disposition of milk: Used for making butter on farms	Disposition of milk: Whole milk fed to calves	Disposition of milk: Milk skimmed or separated for sale of butterfat	Disposition of milk: Retailed by producers [3]	Disposition of milk: Milk sold at wholesale [4]
	Thousands	*Lbs.*	*Lbs.*	*Per cent*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*
Maine	140	4,620	189	4.1	647	26	72	164	15	91	105	200
New Hampshire	76	4,900	191	3.9	372	15	28	32	9	14	43	246
Vermont	275	4,800	194	4.05	1,320	53	64	37	29	220	58	912
Massachusetts	126	5,710	217	3.8	719	27	52	13	14	12	135	493
Rhode Island	21	6,300	243	3.85	132	5	7	1	3	------	12	109
Connecticut	110	5,660	215	3.8	623	24	42	11	16	5	115	434
New York	1,370	5,357	194	3.63	[3] 7,340	266	376	294	220	180	560	5,710
New Jersey	116	5,900	217	3.68	684	25	45	11	14	------	192	422
Pennsylvania	877	4,980	189	3.8	4,367	166	380	365	109	170	730	2,613
North Atlantic	3,111	5,209	195.1	3.75	16,204	607	1,066	928	429	692	1,950	11,139
Ohio	912	4,470	183	4.1	4,077	167	552	334	122	1,151	384	1,534
Indiana	731	4,160	173	4.15	3,041	126	396	164	82	1,150	214	1,035
Illinois	1,054	4,510	171	3.8	4,754	180	544	361	133	1,525	408	1,783
Michigan	822	5,100	194	3.8	4,192	159	394	327	168	1,380	300	1,623
Wisconsin	2,074	5,300	196	3.7	10,992	407	522	71	330	2,880	210	6,979
East North Central	5,593	4,837	185.8	3.84	27,056	1,039	2,408	1,257	835	8,086	1,516	12,954
Minnesota	1,627	4,800	180	3.75	7,810	293	571	222	226	5,850	190	751
Iowa	1,406	4,300	163	3.8	6,046	229	597	360	169	4,300	165	455
Missouri	1,012	3,540	149	4.2	3,582	151	555	490	97	1,800	200	440
North Dakota	602	3,750	141	3.75	2,258	85	241	344	79	1,490	64	40
South Dakota	560	3,580	136	3.8	2,005	76	233	206	72	1,380	67	47
Nebraska	672	4,100	156	3.8	2,755	105	350	328	105	1,642	125	205
Kansas	817	4,000	156	3.9	3,268	127	405	307	124	1,907	190	335
West North Central	6,696	4,140	159.2	3.85	27,724	1,066	2,952	2,257	872	18,369	1,001	2,273
Delaware	33	3,950	154	3.9	130	5	15	9	3	2	20	81
Maryland	180	4,250	168	3.95	765	30	95	75	15	15	98	467
Virginia	381	3,360	138	4.1	1,280	53	296	460	40	130	110	244
West Virginia	210	3,560	150	4.2	748	32	181	262	26	94	110	75
North Carolina	304	3,660	157	4.3	1,113	48	332	536	16	49	89	91
South Carolina	141	3,450	152	4.4	486	21	149	229	6	20	54	28
Georgia	328	3,080	136	4.4	1,010	45	269	510	10	58	58	105
Florida	86	2,770	119	4.3	238	10	35	43	2	6	64	88
South Atlantic	1,663	3,470	146.7	4.23	5,770	244	1,372	2,124	118	374	603	1,179
Kentucky	522	3,440	148	4.3	1,796	77	436	448	31	527	145	209
Tennessee	496	3,240	143	4.4	1,607	71	356	595	21	251	80	304
Alabama	384	3,000	134	4.45	1,152	51	288	647	9	60	64	84
Mississippi	484	2,740	123	4.5	1,326	60	261	500	11	226	55	273
Arkansas	406	3,000	129	4.3	1,218	52	279	498	11	281	77	72
Louisiana	244	2,230	98	4.4	544	24	192	117	5	27	65	138
Oklahoma	710	3,450	147	4.25	2,450	104	462	471	49	1,040	170	258
Texas	1,261	3,180	140	4.4	4,010	177	939	1,190	60	996	285	540
South Central	4,507	3,129	136.7	4.37	14,103	616	3,213	4,466	197	3,408	941	1,878
Montana	183	3,990	156	3.9	730	29	97	106	26	360	66	75
Idaho	186	5,440	215	3.95	1,012	40	106	52	28	535	41	250
Wyoming	69	3,790	146	3.85	262	10	36	29	8	125	24	40
Colorado	251	4,000	152	3.8	1,004	38	136	81	40	427	49	271
New Mexico	67	3,300	132	4.0	221	9	43	29	4	94	35	16
Arizona	42	4,640	179	3.85	195	8	25	12	5	41	42	70
Utah	107	5,300	201	3.8	567	22	64	36	17	163	37	250
Nevada	21	4,880	185	3.8	102	4	8	4	4	66	14	6
Washington	295	5,680	230	4.05	1,676	68	147	64	50	545	141	720
Oregon	247	5,200	224	4.3	1,284	55	121	53	45	555	87	423
California	599	6,600	251	3.8	3,953	150	175	38	119	975	400	2,246
Western	2,067	5,325	209.5	3.93	11,006	433	958	504	355	3,886	936	4,367
United States	23,637	4,309	169.4	3.93	101,863	4,005	11,969	11,536	2,806	34,815	6,947	33,790

Bureau of Agricultural Economics. Estimates of Division of Crop and Livestock Estimates.

[1] Estimated average number of milk cows on farms during 1932. The estimates exclude heifers not yet fresh but include some cows which had calves running with them much of the year.

[2] These estimates exclude milk sucked by calves, milk spilled or lost up to the time it is measured, skimmed, or delivered by farmers, and milk produced by cows not on farms.

[3] Approximations based chiefly on the population in small towns and rural areas where most families purchase their milk supply directly from local farmers. Estimates include milk equivalent of cream.

[4] Estimates include milk delivered to creameries, condensaries, cheese factories, and market-milk receiving stations, but exclude market milk sold to other farmers for local retail delivery.

[5] As computed by counties.

TABLE 380.—*Milk cows: Estimated average price* [1] *per head received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	54.01	54.15	55.29	56.14	55.91	56.34	56.22	55.45	56.13	55.51	55.39	54.66	55.43
1924	55.57	55.40	55.88	55.92	56.37	56.45	55.46	55.74	55.54	54.30	55.05	54.00	55.48
1925	54.81	54.79	56.10	56.85	57.88	57.79	57.05	58.26	58.68	60.17	60.60	60.38	57.97
1926	62.06	63.41	63.17	65.65	66.63	66.74	66.68	65.37	66.12	66.26	66.91	66.74	65.51
1927	66.77	68.22	70.18	71.98	72.43	74.10	74.15	74.24	76.10	78.62	81.00	82.36	74.19
1928	83.11	86.34	87.95	88.55	89.00	89.90	90.37	90.43	92.56	92.86	93.05	92.87	89.75
1929	91.54	91.77	92.80	93.55	94.94	95.20	96.34	95.26	95.55	95.12	94.48	92.61	94.10
1930	89.17	85.02	81.00	80.70	79.53	77.62	71.75	65.91	66.23	66.37	64.68	62.00	74.16
1931	59.00	56.88	56.34	56.53	54.45	51.50	49.47	47.85	46.68	45.58	45.09	44.17	51.28
1932	42.09	40.57	39.42	39.29	37.34	36.10	36.44	36.20	35.88	34.39	33.24	32.40	36.96

Bureau of Agricultural Economics. Monthly prices by States, weighted by number of milk cows Jan. 1, to obtain a price for the United States; yearly price is a simple average of 12 months. For previous data see 1930 or earlier Yearbooks.

[1] As reported by country dealers.

TABLE 381.—*Average production, feed cost, and value per cow, of butterfat and milk, classified on butterfat basis, 12-month records completed in 1931 by dairy herd-improvement associations*

Cows (number)	Milk per cow	Butterfat			Feed costs			Value of product over feed cost	Return for $1 spent for feed	Feed cost per pound of butterfat	Feed cost per 100 pounds of milk
		Quantity	Price per pound	Value	Roughage including pasture	Grain	Total				
	Pounds	*Pounds*	*Dollar*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
78	285	12	0.65	8	35	11	46	−38	0.17	3.83	16.14
481	1,373	55	.61	34	30	13	43	−9	.79	.78	3.13
2,111	2,706	106	.60	63	32	17	49	14	1.29	.46	1.81
8,846	4,005	155	.56	86	33	20	53	33	1.62	.34	1.32
25,187	5,293	203	.55	112	35	25	60	52	1.87	.30	1.13
45,048	6,525	251	.55	138	37	29	66	72	2.09	.26	1.01
52,073	7,688	300	.55	166	39	34	73	93	2.27	.24	.95
41,630	8,828	348	.55	192	40	38	78	114	2.46	.22	.88
24,910	9,967	397	.56	220	42	43	85	135	2.59	.21	.85
11,727	11,111	446	.56	249	43	48	91	158	2.74	.20	.82
4,917	12,351	496	.57	284	45	53	98	186	2.90	.20	.79
1,777	13,539	545	.60	325	48	61	109	216	2.98	.20	.81
655	15,115	596	.61	367	52	68	120	247	3.06	.20	.79
255	16,297	645	.64	411	56	73	129	282	3.19	.20	.79
101	17,426	696	.67	467	63	84	147	320	3.18	.21	.84
57	19,893	748	.70	524	69	88	157	367	3.34	.21	.79
17	21,545	798	.68	542	79	88	167	375	3.25	.21	.78
6	22,820	837	.60	499	52	88	140	359	3.56	.17	.61
6	24,022	900	.62	556	61	98	159	397	3.50	.18	.64
2	22,468	933	.82	764	91	102	193	571	3.96	.21	.86
3	25,252	995	.73	722	80	83	163	559	4.43	.16	.65
1	28,954	1,053	.49	519	45	104	149	370	3.48	.14	.51
Average	7,812	306	.56	170	39	34	73	97	2.33	.24	.93

Bureau of Dairy Industry.

TABLE 382.—*Number of dairy herd-improvement and bull associations, United States, 1906–1932*

Year beginning July —	Dairy herd improvement associations	Cooperative dairy bull associations	Year beginning July —	Dairy herd improvement associations	Cooperative dairy bull associations	Calendar year	Dairy herd improvement associations	Cooperative dairy bull associations
1906	1		1915	211	15	1925	732	220
1907	4		1916	346	24	1926	777	225
1908	6	3	1917	459	36	1927	837	248
1909	25	8	1918	353	44	1928	947	235
1910	40	0	1919	385	78	1929	1,090	339
1911	64	11	1920	468	123	1930	1,143	296
1912	82	11	1921	452	158	1931	1,112	359
1913	100	12	1922	513	190	1932	1,005	402
1914	163	14	1923	627	218			

Bureau of Dairy Industry.

TABLE 383.—*Dairy products: Quantity produced, 1924–1931*

Product	1924	1925	1926	1927	1928	1929	1930	1931
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Creamery butter	1,356,080	1,361,526	1,451,766	1,496,495	1,487,049	1,597,027	1,595,231	1,667,452
Whey butter (made from whey cream)	1,665	1,774	2,872	1,217	1,097	1,221	5,516	(1)
Renovated or process butter	2,813	2,519	2,505	4,286	2,716	2,531	1,850	1,236
American cheese:								
Whole milk	324,695	347,240	335,915	307,777	335,253	370,314	378,816	374,648
Part skim	2,470	2,793	2,927	3,390	2,900	4,951	3,653	3,108
Full skim	1,605	3,298	1,384	1,888	3,048	1,074	669	416
Swiss cheese (including block)	21,844	23,457	20,883	18,141	16,718	19,406	26,393	28,234
Brick and Munster cheese	32,052	34,101	31,048	31,546	28,960	31,763	33,548	35,484
Limburger cheese	9,734	9,163	9,639	8,842	7,437	8,568	8,473	8,508
Cream and Neufchatel cheese	14,945	17,575	18,192	25,962	30,589	34,405	33,213	33,637
All Italian varieties of cheese	1,973	1,562	2,425	3,377	3,587	5,948	8,573	3,493
All other varieties of cheese	4,622	4,325	5,003	5,763	9,027	7,504	7,020	4,851
Cottage, pot, and bakers' cheese	54,347	59,485	67,977	75,679	87,525	94,941	97,641	101,617
Condensed milk (sweetened):								
Case goods—								
Skimmed	2,044	3,135	1,298	1,623	1,366	1,632	2,092	1,757
Unskimmed	187,281	183,807	154,944	161,355	139,077	145,922	121,626	97,469
Bulk goods—								
Skimmed	96,581	114,198	147,473	143,722	154,723	202,475	158,971	140,361
Unskimmed	47,429	44,758	55,737	39,668	38,660	51,689	62,421	45,887
Unsweetened condensed milk (plain condensed): [2]								
Bulk goods—								
Skimmed	83,131	86,954	116,758	126,085	147,625	153,624	156,212	145,416
Unskimmed	82,772	113,556	86,833	101,354	89,336	151,662	128,203	110,038
Evaporated milk (unsweetened:								
Case goods—								
Skimmed	11,555	5,994	11,985	8,100	10,618		1,650	86
Unskimmed	1,189,755	1,202,456	1,158,476	1,273,815	1,337,022	1,499,644	1,449,149	1,428,993
Condensed or evaporated buttermilk	66,837	77,079	86,687	99,180	102,452	107,288	96,431	64,619
Dried or powdered buttermilk	18,058	20,246	31,378	38,435	45,502	54,215	64,601	50,535
Powdered whole milk	7,887	8,931	10,768	11,464	9,605	13,202	15,440	12,627
Powdered skimmed milk	69,219	73,317	91,718	118,123	147,990	207,579	200,675	261,938
Powdered cream	1,018	339	331	338	673	294	400	161
Dried casein (skim milk or buttermilk product)	20,759	16,660	16,953	18,033	22,151	30,537	41,965	35,335
Malted milk	15,889	18,050	20,673	22,116	21,128	22,850	22,691	19,197
Milk sugar (crude)	3,331	5,655	4,476	4,077	5,323	8,965	12,779	9,562
Ice cream of all kinds (gallons)	181,564	214,382	215,248	226,756	232,185	254,618	240,750	208,239

Bureau of Agricultural Economics. Compiled from reports of factories made direct to the bureau. The 1929, 1930, and 1931 statistics are the most complete since these reports were inaugurated in 1918. Some allowance, therefore, should be made for this when comparing production in those years with that of previous years.

[1] Included in creamery butter.
[2] Unsweetened condensed milk (plain condensed) was classified as "Evaporated milk (unsweetened) bulk goods," in previous years.

TABLE 384.—*Dairy products: Quantity produced by months, 1931*

Product	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Creamery butter [1]	118,354	109,596	126,792	145,367	183,783	194,256	161,296	140,395	120,936	126,569	117,035	123,073	1,667,452
Renovated or process butter	127	68	93	88	61	52	86	128	161	169	99	104	1,236
American cheese:													
Whole milk	21,941	22,018	27,571	32,940	44,439	49,513	40,595	32,956	29,139	30,470	23,016	20,050	374,648
Part skim	212	230	245	317	456	373	210	191	188	221	212	253	3,108
Full skim	38	57	69	69	64	58	13	11	9	10	10	8	416
Swiss cheese (including block)	916	802	1,098	1,902	4,026	4,528	3,824	3,249	2,867	2,673	1,513	836	28,234
Munster cheese	462	406	548	570	617	575	404	347	344	401	425	504	5,693
Brick cheese	2,317	2,151	2,562	2,771	3,069	3,147	2,592	2,319	2,125	2,423	2,227	2,088	29,791
Limburger cheese	360	338	520	720	1,040	1,055	834	788	759	841	670	584	8,508
All Italian varieties of cheese	275	265	392	362	362	314	322	279	212	235	230	245	3,493
Neufchatel cheese	1,973	1,944	1,923	1,841	1,897	1,889	1,584	1,411	1,523	1,726	1,873	1,782	21,346
Cream cheese	962	926	1,084	996	1,326	1,194	961	706	952	1,094	1,075	985	12,291
All other varieties of cheese	413	432	483	423	419	407	354	342	374	435	390	398	4,851
Cottage, pot, and bakers' cheese	7,615	7,793	9,508	9,045	9,691	9,111	9,402	8,209	7,821	8,157	7,678	7,587	101,617
Sweetened condensed milk:													
Case goods—													
Skimmed	205	145	102	172	201	144	143	99	188	143	73	142	1,757
Unskimmed	8,701	9,787	10,537	8,131	8,451	6,723	8,086	6,283	6,865	8,726	7,638	7,541	97,469
Bulk goods—													
Skimmed	11,388	8,513	11,384	13,030	15,537	15,522	12,668	12,115	10,427	12,435	8,758	8,564	140,361
Unskimmed	3,744	3,392	3,289	3,630	4,670	4,436	3,768	4,002	4,283	4,501	3,371	2,821	45,887
Unsweetened condensed milk (plain condensed):													
Bulk goods [2]—													
Skimmed	9,003	9,139	11,007	12,513	15,910	18,211	16,344	14,169	12,044	9,866	8,869	9,321	145,416
Unskimmed	8,267	8,831	10,927	10,010	11,603	13,051	11,503	9,539	8,145	6,658	5,639	5,855	110,038
Evaporated milk (unsweetened):													
Case goods—													
Skimmed	1	-----	2	8	9	14	-----	13	21	13	5	-----	86
Unskimmed	104,038	108,929	128,276	147,243	181,982	177,078	128,842	95,205	83,254	99,355	85,949	85,842	1,428,993
Concentrated skim milk (for animal feed)	2,386	2,291	2,385	2,649	3,191	3,295	2,577	2,285	1,818	1,730	1,552	1,452	27,611
Condensed or evaporated buttermilk (including concentrated product)	6,140	5,206	5,147	5,719	7,903	7,615	4,340	4,854	4,882	4,626	3,778	4,409	64,619
Dried or powdered buttermilk	4,686	4,438	4,958	5,049	5,327	5,455	4,189	3,369	2,894	3,210	3,234	3,726	50,535
Powdered whole milk	748	689	871	1,232	1,755	2,230	1,102	575	765	990	670	1,000	12,627
Powdered skim milk	22,087	19,370	23,712	25,320	29,020	26,422	21,869	19,870	18,778	19,167	18,260	20,065	251,938
Powdered cream	-----	-----	72	79	2	4	1	-----	-----	-----	-----	3	161
Dried casein (skim milk or buttermilk product)	3,240	2,981	3,550	3,516	4,066	4,127	2,999	2,366	1,912	2,177	1,940	2,161	35,235
Malted milk	1,901	1,808	1,604	1,915	1,721	1,639	1,480	1,502	1,670	1,610	1,170	1,155	19,197
Milk sugar (crude)	896	837	1,033	974	1,200	1,131	723	549	476	580	530	631	9,562
Ice cream (all kinds), gallons	9,031	9,402	11,818	17,035	22,580	29,654	33,624	25,975	20,560	11,645	8,832	7,783	206,239

Bureau of Agricultural Economics. Compiled from reports made direct to the bureau.

[1] Includes whey butter. [2] Unsweetened condensed milk (plain condensed) was classified as "Evaporated milk (unsweetened) bulk goods," in previous years.

TABLE 385.—*Fluid milk and cream: Receipts [1] at New York, Philadelphia, Boston, and Chicago, by origin—1931 and 1932*

(40-quart units) [2]

State or origin	New York		Philadelphia		Boston		Chicago
	1931	1932	1931	1932	1931	1932	1932
Fluid milk:							
Connecticut	226,755	240,152			5,965		
Delaware	20,745	37,533	509,171	531,282			
Indiana	521						
Maine					653,069	759,217	
Maryland	130,314	159,558	897,193	893,551			
Massachusetts	142,939	158,536			628,173	596,958	
New Hampshire					778,265	744,764	
New Jersey	820,525	3,069,672	531,023	592,659			
New York	24,316,614	23,461,264	3,019		515,957	352,067	
Ohio	12,517	14,578	1,110				
Pennsylvania	5,195,697	5,320,303	5,194,375	4,764,898			
Rhode Island						387	
Vermont	1,293,051	1,515,632			3,834,583	3,840,926	
Virginia			37,120	13,836			
West Virginia			69,976	41,575			
Wisconsin			691	291			
Canada	5,170						
Total	32,164,848	33,977,228	7,243,678	6,838,092	6,416,012	6,294,319	
Fluid cream:							
Alabama					4,859		
Arkansas			406		899		4,652
Connecticut	6,152	5,945				1	
Delaware	826	2,455	6,035	6,324			
Illinois	600	1,478	2,000	8,985	1,400	5,960	208,828
Indiana	14,130	23,672	97,298	70,147	12,897	26,434	20,630
Iowa							5,247
Kansas					2,495	5,165	341
Kentucky			1,200		6,210	3,742	13,511
Maine					75,005	57,793	
Maryland	886	2,665	25,403	39,701	200	6,640	
Massachusetts	2,215	296			1,678	1,264	
Michigan	250	1,200	6,500	2,050	20,079	29,954	3,192
Minnesota	5,483	300	3,018	1,071	7,335	230	42
Mississippi							4
Missouri	850	7,098	7,888	2,618	19,783	36,536	28,370
New Hampshire					21,918	17,071	
New Jersey	18,275	19,391	1,991	620			
New York	1,517,191	1,414,917	21,004	5,265	58,684	24,237	
North Dakota							
Ohio	17,969	23,816	23,894	12,288	17,220	18,399	5,452
Oklahoma							200
Pennsylvania	225,457	189,677	41,719	37,206	500		
Rhode Island						2,041	
South Dakota							2
Tennessee	6,704	2,824	2,155	1,800	13,523	11,695	205
Texas			1,145	400			
Vermont	76,630	117,320			266,386	237,635	
Virginia			9,837	6,982			
West Virginia			6,695	4,031			
Wisconsin	3,645	23,521	75,687	73,792	57,039	57,208	380,233
Canada	1,339	2,456					
Total	*1,898,602*	*1,839,031*	*333,875*	*273,280*	*588,110*	*542,005*	*670,907*

Bureau of Agricultural Economics.

[1] Figures include both rail and truck receipts at Philadelphia and Boston for 1931 and 1932, also New York for 1932, but rail only at New York for 1931; Chicago receipts are rail only. Receipts by truck at New York in 1931 were: Milk, 2,370,129 cans; cream, 14,793 cans.

[2] 40-quart units equal 10 gallons, or about 86 pounds for milk and about 82.5 pounds for cream.

TABLE 386.—*Milk, condensed and evaporated: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Netherlands	319, 831	291	354, 572	358	378, 059	139	393, 151	695	415, 439	1, 320
United States	118, 215	2, 830	115, 551	2, 608	110, 185	2, 634	90, 459	1, 611	75, 085	1, 245
Switzerland	76, 691	35	82, 252	14	78, 475	13	72, 660	15	63, 432	18
Denmark	55, 666	17	52, 597	13	54, 934	2	51, 916	6	40, 233	1
Canada	32, 287	142	27, 118	137	26, 746	179	20, 471	164	14, 458	148
Australia [2]	20, 852	70	19, 975	27	17, 395	52	11, 459	21	....	....
Norway	18, 462	789	18, 747	646	15, 534	323	13, 447	111	11, 170	154
Italy	9, 804	1, 335	7, 092	1, 728	4, 629	2, 124	5, 141	1, 761	6, 374	1, 461
Irish Free State	8, 658	1, 598	10, 747	1, 282	10, 503	1, 116	10, 321	909	6, 085	1, 328
Belgium [3]	2, 582	1, 416	3, 516	1, 296	4, 369	993	7, 389	1, 420	9, 542	[4] 6, 327
Czechoslovakia	532	360	366	173	199	222	280	281	293	251
New Zealand [4]	1, 494	23	1, 367	3	2, 175	7	2, 331	1	1, 004	9
Total	665, 074	8, 906	693, 900	8, 285	703, 203	7, 804	679, 025	6, 995	653, 015	12, 271
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	21, 867	280, 504	25, 046	301, 978	27, 732	296, 501	22, 441	291, 010	13, 213	312, 532
Cuba	0	47, 460	0	44, 340	0	46, 492	0	38, 767	....	....
Dutch East Indies	15	27, 265	0	30, 875	0	34, 990	0	33, 416	0	[5] 12, 002
Philippine Islands	0	25, 810	0	26, 524	0	29, 875	0	29, 077	0	35, 253
British India	0	22, 365	0	26, 354	0	27, 436	0	27, 261	0	21, 531
Germany [6]	1, 960	15, 079	1, 477	13, 290	4, 235	8, 264	6, 772	4, 351	2, 839	1, 966
France	8, 910	13, 493	12, 483	12, 271	10, 204	12, 975	13, 127	14, 965	14, 074	17, 610
China	0	12, 227	0	14, 643	0	13, 285	0	11, 353	0	9, 945
Union of South Africa	27	11, 305	45	12, 020	16	12, 132	447	4, 310	1, 060	2, 510
Japan	320	9, 171	385	8, 411	316	8, 865	786	8, 396	2, 228	7, 679
Peru [4]	0	8, 593	0	8, 444	0	8, 667	0	7, 708	....	....
Siam [7]	0	7, 076	0	8, 827	0	8, 447	0	8, 311	....	....
Indo-China	162	6, 275	[2] 123	3, 792	[2] 72	8, 245	89	7, 321	....	....
Greece	0	6, 644	0	8, 043	0	7, 879	0	7, 218	0	6, 178
Jamaica	0	4, 198	0	4, 614	0	5, 084	0	5, 129	....	....
Algeria	186	3, 694	205	4, 910	270	4, 105	1, 052	6, 056	....	....
Trinidad and Tobago	0	3, 181	0	3, 706	0	3, 850	0	4, 130	....	....
Tunis	0	2, 343	0	2, 707	0	2, 693	0	3, 118	....	....
Brazil	0	1, 431	0	1, 356	0	1, 252	0	1, 205	0	494
Argentina	15	1, 418	12	1, 353	15	1, 578	17	1, 550	13	1, 049
Egypt	353	1, 356	368	1, 347	504	1, 525	123	1, 808	0	1, 780
Austria [6]	213	1, 214	349	1, 205	371	1, 247	676	1, 384	395	1, 802
Poland	34	327	19	464	1	385	7	267	1	239
Total	34, 062	512, 429	40, 512	544, 474	43, 736	545, 772	45, 537	518, 111	33, 823	432, 570

Bureau of Agricultural Economics. Official sources except where otherwise stated.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Exports include powdered milk.
[4] Imports include powdered milk.
[5] Java and Madura only.
[6] Includes some powdered milk.
[7] Figures for 12 months ending Mar. 31 of following year.

TABLE 387.—*Milk: Estimated average price per 100 pounds received by producers; United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923[1]	2.79	2.81	2.75	2.75	2.65	2.70	2.64	2.70	2.81	2.98	3.02	2.92
1924	2.80	2.84	2.75	2.50	2.40	2.40	2.29	2.18	2.35	2.43	2.45	2.55
1925	2.48	2.55	2.62	2.48	2.47	2.47	2.45	2.55	2.56	2.73	2.69	2.65
1926	2.74	2.68	2.56	2.46	2.39	2.35	2.40	2.37	2.47	2.46	2.60	2.61
1927	2.68	2.64	2.55	2.58	2.51	2.44	2.40	2.36	2.48	2.55	2.56	2.64
1928	2.67	2.60	2.61	2.51	2.49	2.45	2.45	2.46	2.56	2.60	2.63	2.65
1929	2.64	2.64	2.63	2.59	2.53	2.47	2.46	2.50	2.52	2.55	2.60	2.60
1930	2.53	2.44	2.39	2.35	2.28	2.22	2.15	2.18	2.25	2.30	2.31	2.20
1931	2.04	1.90	1.92	1.85	1.73	1.68	1.62	1.64	1.70	1.72	1.73	1.67
1932	1.56	1.49	1.43	1.39	1.29	1.17	1.20	1.21	1.25	1.28	1.26	1.26

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number of milk cows Jan. 1, to obtain a price for the United States. Prices quoted are for milk sold to dealers, factories, etc.

[1] Prices from January to August 1923, estimated on the basis of changes in reported prices per gallon.

TABLE 388.—*Milk: Milk dealers' average buying prices per hundredweight for standard grade milk testing 3.5 per cent butterfat which is used for city distribution as milk and cream, 1923–1932*

[F. o. b. local shipping point or country plant]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	2.75	2.67	2.66	2.63	2.65	2.53	2.56	2.67	2.76	2.79	2.89	2.82	2.69
1924	2.86	2.74	2.69	2.63	2.56	2.42	2.47	2.51	2.61	2.64	2.71	2.67	2.63
1925	2.68	2.73	2.65	2.62	2.58	2.50	2.55	2.65	2.66	2.79	2.78	2.80	2.67
1926	2.87	2.79	2.78	2.77	2.64	2.62	2.65	2.68	2.71	2.76	2.79	2.84	2.74
1927	2.83	2.78	2.74	2.71	2.67	2.62	2.63	2.67	2.68	2.75	2.78	2.81	2.72
1928	2.87	2.83	2.79	2.74	2.65	2.65	2.66	2.73	2.76	2.82	2.86	2.88	2.77
1929	2.87	2.86	2.83	2.79	2.77	2.69	2.76	2.77	2.82	2.85	2.88	2.86	2.81
1930	2.81	2.77	2.74	2.69	2.63	2.57	2.60	2.60	2.73	2.69	2.69	2.59	2.68
1931	2.46	2.38	2.33	2.25	2.14	2.16	2.13	2.20	2.14	2.14	2.10	2.00	2.20
1932	1.95	1.88	1.80	1.77	1.71	1.69	1.62	1.64	1.64	1.68	1.64	1.57	1.72

Bureau of Agricultural Economics. Compiled from reports of the bureau, secured through the cooperation of milk distributors, producers, associations, and municipal officers.

TABLE 389.—*Milk: Average prices per hundredweight paid producers by condensaries for milk testing 3.5 per cent butterfat, f. o. b. factory, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1923	2.40	2.37	2.31	2.22	2.04	2.02	2.12	2.16	2.18	2.23	2.21	2.21	2.21
1924	2.18	2.13	2.09	1.93	1.72	1.64	1.66	1.66	1.66	1.70	1.71	1.85	1.83
1925	1.92	1.93	1.93	1.93	1.88	1.82	1.91	1.98	2.01	2.09	2.15	2.15	1.81
1926	2.17	2.06	2.03	1.93	1.81	1.79	1.79	1.84	1.95	2.00	2.09	2.22	1.97
1927	2.28	2.28	2.20	2.14	2.00	1.91	1.91	2.00	2.07	2.15	2.20	2.25	2.12
1928	2.27	2.22	2.08	2.05	1.97	1.92	1.96	2.07	2.16	2.19	2.21	2.28	2.12
1929	2.23	2.18	2.14	2.07	1.99	1.92	1.91	1.96	1.97	2.04	2.07	2.02	2.04
1930	1.87	1.71	1.69	1.68	1.67	1.58	1.54	1.61	1.72	1.75	1.67	1.56	1.67
1931	1.42	1.35	1.27	1.21	1.12	1.04	1.02	1.02	1.12	1.22	1.23	1.19	1.18
1932	1.12	.99	.95	.93	.86	.81	.77	.80	.85	.86	.86	.92	.89

Bureau of Agricultural Economics. Compiled from reports of the bureau, secured through the cooperation of firms operating condenseries.

TABLE 390.—*Milk, standard or grade B: Retail price per quart, delivered to family trade in cities, 1920–1932*

[This price represents the dealers selling price per quart, bottled, delivered to families]

City	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Boston	17.2	15.5	13.6	14.3	13.4	13.9	14.5	14.7	15.2	15.4	15.3	12.9	10.5
New York	16.7	15.1	14.6	14.8	13.9	14.8	15.0	15.3	15.6	16.0	15.7	14.7	12.0
Philadelphia	14.2	11.7	11.2	12.5	12.0	12.0	12.2	13.0	13.0	13.3	13.0	11.7	10.0
Pittsburgh	15.7	14.1	12.5	14.3	14.1	14.1	14.0	14.5	14.0	14.2	13.3	11.6	8.9
Cleveland	15.5	13.5	11.4	13.8	13.3	14.0	14.2	14.2	13.9	12.5	12.1	10.7	8.7
Indianapolis	14.0	12.5	10.4	11.8	11.9	11.0	12.0	12.0	12.1	12.3	11.9	10.2	9.4
Chicago	14.8	13.3	12.0	13.5	14.0	14.0	14.0	14.0	14.0	14.0	14.0	13.0	11.2
Detroit	15.8	13.0	12.5	13.8	13.8	13.6	14.0	13.9	14.0	14.0	13.1	11.6	9.1
Milwaukee	12.3	9.4	9.2	10.4	10.8	10.0	10.8	11.0	11.0	11.2	11.4	9.9	8.3
Minneapolis	13.4	11.2	10.4	11.4	11.0	11.3	11.1	11.2	12.0	12.0	11.0	10.0	8.1
St. Louis	15.7	13.4	11.1	13.0	13.0	13.0	13.0	13.0	13.0	13.0	12.9	11.7	10.1
Kansas City, Mo	15.5	13.8	11.9	13.0	13.0	13.0	13.0	13.0	13.4	13.5	13.2	12.2	10.2
Washington, D. C	17.0	14.7	13.3	14.2	14.3	14.2	14.6	15.0	14.9	14.5	14.5	14.1	13.3
Jacksonville	22.0	19.0	16.0	17.0	18.0	16.8	20.2	19.2	18.6	18.6	18.5	15.8	12.7
Louisville	16.0	12.8	10.2	12.4	12.5	12.7	12.5	12.5	12.6	13.0	12.4	11.3	10.0
Birmingham	21.0	19.0	17.1	16.0	16.9	18.0	18.0	17.0	18.0	16.1	16.0	13.5	13.0
New Orleans	18.2	15.8	14.0	14.2	14.3	13.2	14.0	14.0	14.0	14.0	14.0	12.7	10.7
Dallas	21.3	16.0	14.0	15.0	15.0	15.0	12.8	12.4	12.3	13.0	13.0	11.0	9.4
Butte	15.0	13.4	12.2	12.8	13.3	13.4	13.1	13.0	13.0	13.0	13.0	12.4	10.0
Denver	12.9	11.3	10.0	12.0	11.9	11.2	12.0	12.0	12.0	12.0	11.0	10.0	10.0
Salt Lake City	12.5	12.5	8.8	10.1	9.8	10.6	10.3	10.5	10.0	10.0	10.0	9.9	9.0
Seattle	13.6	12.1	12.6	12.5	10.8	12.2	12.6	12.0	11.7	12.2	11.0	10.7	9.6
Portland, Oreg	14.0	12.8	11.5	12.2	11.2	11.4	12.0	11.9	12.0	12.0	12.6	10.4	9.1
Los Angeles	17.0	15.2	14.2	15.0	15.5	14.9	15.0	15.0	15.0	15.0	14.6	12.0	10.5
San Francisco	16.2	14.4	12.6	12.8	14.0	14.0	14.0	14.0	14.0	14.0	14.0	11.8	12.0

Bureau of Agricultural Economics. Compiled from reports of the bureau secured through the cooperation of milk distributors, producers' associations, and municipal officers.

TABLE 391.—*Butterfat: Estimated average price per pound received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	47.0	44.9	44.9	46.0	40.3	36.9	36.7	38.7	42.2	44.1	47.8	49.2	42.2
1924	50.6	48.5	46.4	40.8	37.6	37.1	37.8	35.8	36.6	36.6	37.0	41.1	39.8
1925	40.6	37.9	41.5	40.5	40.3	39.9	40.5	41.3	42.6	47.1	47.8	47.6	41.9
1926	45.2	43.1	42.9	40.4	39.1	39.3	38.6	38.6	40.5	42.4	44.8	47.9	41.3
1927	46.9	46.8	48.0	47.1	43.6	40.8	40.3	39.4	41.6	44.4	45.8	47.8	43.7
1928	48.5	46.0	46.5	45.4	44.4	43.5	43.3	44.3	46.5	47.0	47.6	49.2	45.6
1929	47.6	47.8	48.3	46.5	45.4	43.6	43.4	43.3	44.6	45.6	43.5	41.9	44.9
1930	36.7	35.4	34.9	37.3	36.5	31.6	31.6	35.2	37.7	37.0	35.3	30.6	34.8
1931	26.2	25.0	27.5	26.4	21.2	20.5	21.1	23.9	26.6	30.3	28.2	27.3	24.7
1932	22.8	19.8	19.5	17.8	16.3	14.6	14.4	17.5	17.6	17.8	18.4	21.1	17.6

Bureau of Agricultural Economics. Quotations cover butterfat for all uses. Based on reports of special price reporters. Monthly prices by States, weighted by number of milk cows Jan. 1, to obtain a price for The United States; yearly price obtained by weighting monthly prices by production of creamery butter.

TABLE 392.—*Creamery butter: Production reported by factories, United States 1922–1931*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1922	73,505	67,405	79,532	86,623	132,351	150,034	135,231	114,160	92,359	83,070	68,628	70,617	1,153,515
1923	83,688	74,134	88,311	100,547	134,350	158,371	138,278	120,802	102,273	89,297	74,909	77,254	1,242,214
1924	87,468	86,731	95,760	106,012	139,954	161,992	164,443	137,836	115,102	100,536	77,282	82,964	1,356,080
1925	87,121	80,218	92,302	107,023	145,478	164,253	158,920	136,738	108,325	104,520	85,492	91,136	1,361,526
1926	97,893	94,222	112,432	121,049	155,912	178,276	159,554	133,294	116,732	103,068	88,481	90,853	1,451,766
1927	97,965	95,522	111,451	126,415	168,808	188,792	170,484	146,808	113,546	102,399	86,058	88,247	1,496,495
1928	101,045	99,394	111,777	118,849	156,294	181,037	167,601	145,430	119,499	105,894	87,745	92,484	1,487,049
1929	103,519	99,963	114,404	133,684	174,341	192,869	185,317	152,192	123,582	118,116	97,186	101,854	1,597,027
1930	108,382	102,252	115,679	133,271	184,385	189,788	167,559	137,420	122,580	120,247	101,974	111,694	1,595,231
1931	118,354	109,596	126,792	145,367	183,783	194,256	161,296	140,395	120,936	126,569	117,035	123,073	1,667,452

Bureau of Agricultural Economics. The 1929, 1930 and 1931 statistics are the most complete since these reports were inaugurated in 1918. Some allowance, therefore, should be made for this when comparing production for those years with that of previous years.

TABLE 393.—*Creamery butter production in factories in the United States, by States, average 1925–1929, annual 1930–1931*

State	Average 1925–1929	1930	1931 [1]	State	Average 1925–1929	1930	1931 [1]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*		*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Maine	429	202	94	Kentucky	18,060	17,645	18,288
New Hampshire	74	22	8	Tennessee	14,713	15,745	14,997
Vermont	6,731	3,581	3,402	Alabama	1,269	2,160	1,950
Massachusetts	2,105	1,869	1,394	Mississippi	6,876	6,048	7,337
Rhode Island	71	28	24	E. South Cent	40,918	41,598	42,572
Connecticut	523	364	382	Arkansas	1,620	2,039	3,066
New England	9,933	6,066	5,304	Louisiana	370	705	1,452
New York	12,941	9,617	10,024	Oklahoma	21,834	24,654	28,093
New Jersey	70	41	63	Texas	19,369	25,083	30,291
Pennsylvania	11,491	10,766	11,090	W. South Cent	43,193	52,481	62,902
Middle Atlantic	24,502	20,424	21,177	Wyoming	2,090	2,255	2,290
Ohio	78,564	78,972	81,515	Colorado	20,291	22,643	21,993
Indiana	59,500	63,249	67,991	New Mexico	437	951	1,080
Illinois	*62,286*	*65,281*	*67,282*	*Idaho*	*19,865*	20,353	28,644
Michigan	68,273	65,926	75,601	Arizona	1,768	1,994	2,547
Wisconsin	153,589	171,644	176,091	Utah	9,119	11,969	11,963
E. North Cent	422,212	445,072	468,480	Nevada	2,331	1,993	1,974
Minnesota	268,639	282,540	284,270	Montana	15,865	16,792	14,884
Iowa	182,608	216,058	219,428	Mountain	71,766	84,950	85,355
Missouri	67,414	77,939	79,435	Washington	28,827	32,256	37,293
North Dakota	34,328	41,032	50,412	Oregon	22,071	26,641	29,062
South Dakota	33,413	40,406	42,080	California	72,797	74,366	73,850
Nebraska	92,680	85,623	86,084	Pacific	123,695	133,263	139,705
Kansas	52,831	56,919	68,997	Total	1,478,773	1,595,231	1,667,452
W. North Cent	731,913	800,517	830,706				
Delaware	57	41	35				
Maryland	246	95	80				
Dist. of Columbia	103	----	----				
Virginia	5,207	5,255	5,740				
West Virginia	403	462	362				
North Carolina	1,861	2,050	2,081				
South Carolina	422	453	594				
Georgia	2,242	2,397	2,102				
Florida	100	107	257				
South Atlantic	10,641	10,860	11,251				

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau.

[1] Includes whey butter.

TABLE 394.—*Butter: Receipts, gross weight,[1] at five markets, 1919–1932*

	New York	Chicago	Philadelphia	Boston	San Francisco		New York	Chicago	Philadelphia	Boston	San Francisco
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*		*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1919	226,698	185,779	51,191	73,223	19,663	1926	252,742	236,546	79,345	83,243	27,666
1920	164,608	176,746	48,630	72,993	24,412	1927	261,322	235,200	81,727	84,617	26,709
1921	213,978	193,593	58,926	74,303	25,264	1928	250,593	230,514	84,495	87,324	24,032
1922	241,604	213,101	64,551	80,473	27,778	1929	265,760	244,632	87,386	81,183	25,155
1923	243,764	225,892	68,598	82,659	25,520	1930	268,070	233,638	83,762	72,455	24,738
1924	248,759	258,083	76,731	86,921	26,260	1931	274,218	243,694	90,585	77,200	26,692
1925	244,127	254,308	72,064	82,476	28,680	1932	282,520	223,428	92,243	81,984	28,750

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 395.—*Creamery butter: Receipts, gross weight,*[1] *at five markets, by months, specified years*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
New York:													
1930	20, 877	19, 579	21, 523	22, 868	26, 723	29, 898	27, 567	19, 519	19, 690	19, 431	17, 910	22, 485	268, 070
1931	22, 639	21, 645	22, 237	23, 169	25, 280	31, 434	25, 661	18, 860	19, 334	20, 904	20, 773	22, 282	274, 218
1932	23, 243	24, 212	24, 578	22, 382	30, 222	32, 237	25, 276	24, 220	19, 090	18, 235	18, 550	20, 275	282, 520
Chicago:													
1930	16, 837	16, 422	19, 877	20, 317	27, 434	29, 585	24, 689	18, 189	15, 979	15, 191	14, 349	14, 769	233, 638
1931	16, 375	15, 584	19, 601	21, 833	27, 162	32, 112	24, 265	18, 354	16, 584	17, 267	17, 503	17, 055	243, 695
1932	18, 318	16, 639	17, 281	18, 006	22, 876	27, 561	22, 981	19, 750	16, 493	14, 392	13, 913	15, 218	223, 428
Philadelphia:													
1930	6, 956	6, 144	6, 674	7, 119	8, 263	9, 183	8, 127	6, 127	5, 942	5, 649	5, 976	7, 602	83, 702
1931	7, 768	6, 972	7, 744	8, 170	8, 536	10, 247	7, 509	6, 468	6, 799	6, 035	6, 660	7, 676	90, 585
1932	7, 217	8, 151	7, 875	7, 848	9, 838	10, 322	7, 085	6, 568	6, 538	6, 603	7, 264	6, 934	92, 243
Boston:													
1930	4, 615	4, 266	5, 225	6, 257	8, 646	10, 899	9, 640	6, 524	4, 601	3, 790	3, 368	4, 534	72, 455
1931	5, 028	4, 911	5, 281	6, 533	8, 163	9, 874	8, 591	6, 537	5, 507	5, 292	5, 664	5, 819	77, 200
1932	5, 984	5, 947	6, 090	6, 714	9, 020	9, 952	8, 543	7, 762	5, 974	4, 880	5, 843	5, 275	81, 984
San Francisco:													
1930	1, 590	1, 555	1, 881	2, 566	3, 438	2, 769	2, 639	1, 975	1, 442	1, 467	1, 515	1, 901	24, 738
1931	1, 530	1, 417	2, 148	2, 928	3, 134	3, 009	2, 300	2, 440	1, 859	1, 743	1, 886	2, 298	26, 692
1932	2, 013	2, 022	2, 390	2, 995	3, 597	3, 157	2, 628	2, 107	1, 840	2, 019	1, 664	2, 318	28, 750
Total:													
1923	47, 843	39, 877	48, 955	47, 947	64, 328	89, 976	75, 336	56, 243	49, 307	45, 393	39, 759	41, 460	646, 424
1924	44, 476	47, 756	52, 328	51, 690	67, 572	91, 742	92, 036	67, 959	56, 247	49, 760	35, 868	39, 471	696, 005
1925	44, 825	41, 785	48, 351	50, 035	67, 454	88, 024	82, 918	68, 341	53, 303	51, 599	42, 099	42, 993	681, 727
1926	46, 809	46, 809	54, 646	53, 990	64, 653	89, 993	81, 053	59, 849	52, 985	45, 280	40, 588	42, 825	679, 480
1927	44, 756	45, 502	53, 633	57, 298	75, 535	89, 773	79, 670	68, 055	50, 055	45, 425	39, 895	39, 978	689, 575
1928	50, 095	47, 797	54, 300	52, 158	63, 582	81, 318	75, 901	64, 531	52, 481	48, 907	42, 796	43, 092	676, 958
1929	52, 490	48, 557	53, 979	56, 881	73, 879	81, 180	79, 442	64, 103	51, 972	50, 246	44, 739	46, 648	704, 116
1930	50, 875	47, 966	55, 180	59, 127	74, 504	82, 334	72, 662	52, 334	47, 744	45, 528	43, 118	51, 291	682, 663
1931	53, 240	50, 529	57, 011	62, 633	72, 275	86, 676	68, 326	52, 659	50, 083	51, 242	52, 486	55, 130	712, 390
1932	56, 775	56, 971	58, 214	57, 945	75, 553	83, 229	66, 513	60, 407	49, 935	46, 129	47, 234	50, 020	708, 925

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 396.—*Creamery butter:*[1] *Cold-storage holdings, United States, 1923–1932*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1923	26, 819	16, 122	8, 910	4, 824	3, 248	10, 112	62, 768	101, 774	102, 731	96, 117	76, 472	51, 508
1924	30, 299	15, 246	9, 847	7, 842	8, 913	22, 348	74, 184	134, 118	156, 440	153, 494	135, 018	100, 832
1925	65, 694	45, 748	28, 789	10, 875	3, 739	13, 036	63, 687	109, 075	128, 403	114, 172	94, 916	74, 754
1926	52, 785	39, 381	26, 313	17, 392	17, 527	30, 561	86, 897	131, 152	138, 151	125, 342	100, 871	64, 381
1927	34, 347	17, 952	7, 952	3, 044	3, 436	25, 404	89, 996	145, 147	163, 701	147, 396	118, 679	83, 224
1928	46, 289	28, 273	14, 404	5, 716	5, 109	15, 952	69, 750	120, 437	136, 175	128, 071	105, 811	70, 985
1929	43, 783	24, 747	11, 910	5, 532	5, 883	28, 369	91, 962	151, 621	168, 952	158, 541	138, 405	111, 650
1930	81, 935	60, 230	46, 530	30, 556	22, 957	50, 378	106, 522	145, 061	143, 089	131, 489	109, 646	88, 012
1931	63, 401	46, 792	30, 672	18, 010	17, 195	35, 155	89, 172	115, 121	104, 678	80, 152	56, 229	42, 242
1932	26, 643	22, 506	15, 243	9, 094	10, 394	29, 160	84, 269	110, 247	107, 259	89, 490	66, 828	37, 207

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

[1] Quantities given are net weights.

TABLE 397.—*Butter: Receipts, gross weight,*[1] *at five markets, by State of origin, 1928–1932*

Market and origin	1928	1929	1930	1931	1932
NEW YORK	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Ala.	370	154	159	110	67
Ark.	42	247	153	224	28
Calif.	218	1	82	48	33
Ga.	86	39	137	120	181
Ill.	35,816	35,738	34,307	35,186	20,198
Ind.	5,150	4,890	4,790	5,106	5,494
Iowa	68,676	78,347	74,630	74,145	83,428
Kans.	4,797	6,520	7,512	7,136	12,066
Ky.	884	617	573	549	933
Md.	283	196	240	15	23
Mass.	66	15	87	206	74
Mich.	15,227	7,555	8,802	12,601	7,317
Minn.	44,654	56,333	65,983	62,081	75,812
Miss.	812	1,070	623	795	40
Mo.	6,182	6,573	4,345	5,582	5,856
Mont.	296	278	337	28	------
Nebr.	23,138	26,803	26,825	29,877	33,197
N. J.	93	123	1	112	381
N. Y.	5,978	5,097	7,119	4,837	2,373
N. C.	415	429	215	55	28
N. Dak.	2,397	2,052	2,514	5,798	5,707
Ohio	7,498	6,217	6,925	7,155	5,890
Okla.	502	1,302	771	1,417	2,767
Pa.	1,074	1,923	1,982	1,850	2,047
S. Dak.	1,290	1,503	1,151	984	1,570
Tenn.	2,305	2,906	2,465	1,614	1,501
Tex.	831	2,304	995	930	1,877
Va.	535	467	244	273	221
Wash.	26	27	29	26	32
Wis.	15,459	15,830	13,917	14,503	13,110
Other States	419	193	201	165	128
Canada	74	2	47	600	83
Total	250,593	265,760	268,070	274,218	282,520
CHICAGO					
Ark.	68	155	118	229	966
Colo.	1,315	977	780	242	126
Idaho	7	8	27	------	76
Ill.	6,371	8,406	15,594	20,061	19,274
Ind.	943	1,098	1,217	1,375	3,821
Iowa	39,948	44,152	39,606	42,450	35,898
Kans.	12,981	11,185	9,928	15,283	20,271
Ky.	1,894	2,067	1,353	989	397
Mich.	923	854	576	877	1,551
Minn.	50,230	54,043	46,380	39,550	25,534
Miss.	49	239	143	290	352
Mo.	11,508	13,020	12,487	14,866	16,668
Mont.	165	235	159	3	25
Nebr.	19,498	17,450	16,225	15,136	13,918
N. Y.	275	35	107	28	9
N. Dak.	2,919	3,287	2,384	3,053	1,720
Ohio	128	78	251	607	128
Okla.	2,329	3,175	3,104	4,507	6,763
S. Dak.	18,270	16,187	13,496	12,855	10,666
Tenn.	113	166	75	31	107
Tex.	2,322	2,325	1,483	2,920	4,079
Wis.	58,108	65,356	68,047	68,190	61,009
Other States	150	134	98	153	70
Canada	------	------	------	------	------
Total	230,514	244,632	233,638	243,695	223,428
PHILADELPHIA					
Ala.	30	26	17	103	164
Ill.	3,811	4,029	4,652	9,166	4,485
Ind.	1,502	1,523	1,647	1,298	1,412
PHILA.—Con.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Iowa	4,808	6,446	6,220	6,825	8,083
Kans.	384	135	70	387	729
Ky.	212	130	111	365	520
Md.	98	85	72	41	3
Mich.	1,356	568	1,342	3,029	335
Minn.	54,427	54,499	52,743	50,864	56,149
Miss.	695	214	268	335	1,366
Mo.	1,921	2,385	1,767	3,115	3,511
Nebr.	4,271	5,038	2,824	4,082	4,333
N. Y.	600	529	604	859	255
N. C.	5	96	148	77	108
Ohio	2,665	1,934	1,854	1,261	1,230
Pa.	731	612	626	656	624
S. Dak.	418	582	215	401	736
Tenn.	1,742	2,360	1,967	973	1,294
Tex.	26	41	222	842	1,456
Va.	881	1,289	665	990	776
W. Va.	225	53	55	66	13
Wis.	3,307	4,585	5,395	4,185	3,210
Other States	290	233	188	640	1,451
Canada	------	------	------	24	------
Total	84,495	87,386	83,762	90,585	92,243
BOSTON					
Colo.	867	442	83	129	------
Ill.	12,251	11,893	12,065	13,493	12,535
Ind.	1,808	3,495	2,842	2,917	2,951
Iowa	4,261	4,257	4,397	3,173	3,690
Kans.	1,801	1,268	796	587	518
Ky.	298	580	222	47	104
Mass.	168	15	3	99	113
Mich.	1,787	703	993	1,279	1,073
Minn.	33,652	28,908	29,119	32,719	25,627
Mo.	3,989	3,221	2,408	2,224	3,345
Mont.	14	29	237	87	------
Nebr.	12,159	12,315	7,438	4,746	4,756
N. H.	14	3	2	5	3
N. Y.	1,626	1,380	1,208	1,954	483
N. Dak.	1,227	2,247	880	1,863	7,716
Ohio	2,879	3,214	2,942	4,267	3,614
Okla.	575	825	540	964	1,927
Pa.	95	192	81	250	45
S. Dak.	2,985	2,851	1,911	2,562	6,667
Tenn.	------	104	119	143	------
Tex.	170	550	251	461	460
Vt.	1,974	781	185	154	71
Wis.	2,057	1,679	3,292	2,835	5,853
Other States	665	231	441	192	483
Canada	2	------	------	------	------
Total	87,324	81,183	72,455	77,200	81,984
SAN FRANCISCO					
Calif.	17,732	19,070	18,110	18,473	20,510
Colo.	260	159	93	144	159
Idaho	1,255	1,361	1,223	1,515	965
Mont.	2,150	1,222	2,018	1,424	1,199
Nebr.	33	81	87	37	252
Nev.	74	41	184	14	26
Oreg.	1,796	2,748	2,489	3,687	4,712
Utah	384	134	35	38	231
Wash.	182	231	496	1,340	543
Other States	166	108	4	29	153
Canada	------	------	------	------	------
Total	24,032	25,155	24,738	26,692	28,750

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 398.—*Butter: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Denmark	310,967	1,886	325,710	1,621	350,616	1,424	372,553	1,388	378,423	1,596
New Zealand	156,179	6	162,352	0	185,226	1	211,035	1	222,719	12
Australia [2]	*100,464*	*3,448*	*112,811*	*2,561*	*102,913*	*5*	*126,598*	*4*	------	------
Netherlands	100,310	4,548	103,486	5,123	104,323	4,469	92,393	4,396	72,659	8,887
Russia	*62,901*	*0*	*71,888*	*0*	*55,933*	*0*	*23,197*	*0*	------	*0*
Argentina	50,410	7	44,182	7	37,546	2	51,156	7	51,167	0
Irish Free State	58,409	6,215	62,623	5,880	62,774	4,478	58,766	3,342	42,307	3,324
Sweden	37,607	133	38,679	93	54,960	24	58,805	19	43,045	39
Finland	31,509	42	29,488	3	36,610	3	37,726	8	38,367	------
Latvia	24,641	0	28,673	0	32,694	0	40,631	0	41,310	0
Estonia	21,439	6	24,741	31	27,247	1	31,010	0	31,844	0
Poland	17,426	350	24,194	77	33,248	112	26,713	30	27,470	32
France	15,492	6,600	22,227	5,217	14,945	8,776	10,722	12,922	11,037	40,837
Italy	4,043	1,600	1,779	3,565	1,941	1,937	1,851	3,130	1,289	6,203
Yugoslavia	571	2	482	1	635	0	655	1	668	0
Total	992,368	24,843	1,053,315	24,179	1,101,611	21,232	1,143,811	25,248	962,305	60,936
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	1,465	647,350	1,395	660,231	1,096	702,749	1,115	744,623	869	864,612
Germany	275	249,016	281	279,000	337	298,821	578	293,557	269	220,946
Switzerland	155	18,070	150	18,061	158	16,650	40	18,795	17	23,359
Canada	8,510	14,638	1,995	16,802	1,400	35,928	1,180	38,606	10,680	2,821
Dutch East Indies	0	9,758	0	11,086	0	11,098	0	10,910	0	[3] 9,120
United States	4,558	6,227	3,898	4,659	3,724	2,773	2,954	2,472	1,984	1,882
Belgium	2,470	5,856	3,712	2,917	2,909	9,602	2,647	22,630	2,756	41,560
Austria	932	2,921	1,094	1,785	2,211	1,099	4,111	544	2,861	1,565
Union of South Africa	839	2,420	393	3,921	2,337	1,604	2,904	1,690	4,521	1,244
Egypt	53	2,341	51	1,774	30	2,158	23	2,935	78	2,521
Algeria	48	2,085	41	2,490	64	2,465	[2] 81	[2] 4,592	------	------
Norway	421	1,846	82	1,532	1,191	1,352	236	1,529	1,629	380
British Malaya	*187*	*1,811*	*181*	*2,196*	*177*	*1,930*	*193*	*2,067*	*104*	*1,803*
Cuba	5	1,780	3	1,204	21	992	38	448	------	------
Peru	6	1,706	2	2,116	2	1,484	4	623	2	------
China	0	1,661	0	1,945	0	1,372	0	1,417	0	1,434
Greece	0	1,251	0	1,172	------	1,537	------	1,420	------	2,060
Philippine Islands	0	1,200	0	1,412	0	1,338	0	1,188	0	1,758
Czechoslovakia	605	1,174	1,296	990	716	835	694	716	662	4,107
Trinidad and *Tobago*	0	1,139	0	823	0	1,524	0	1,058	0	------
Spain	328	363	169	466	177	408	160	329	88	122
Total	20,857	974,615	14,743	1,022,588	16,550	1,097,719	16,958	1,152,149	26,520	1,181,354

Bureau of Agricultural Economics. *Official sources except where otherwise noted.* Butter includes all butter made from milk, melted and renovated butter, but does not include margarine, cocoa butter, or ghee.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Java and Madura only.

TABLE 399.—*Butter, 92-score creamery: Average wholesale price, at five leading markets, by months, specified years*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
New York:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910	33	30	33	31	28	28	28	29	30	30	31	30	30
1911	26	26	24	21	22	23	25	26	27	30	34	37	27
1912	39	32	31	33	30	27	27	27	30	31	34	37	32
1913	35	36	37	35	29	28	27	28	32	31	34	36	32
1914	33	29	28	25	26	27	28	30	31	32	35	34	30
1915	34	32	30	31	29	28	27	26	27	29	31	35	30
1916	33	34	37	36	31	30	29	31	34	35	39	40	34
1917	40	44	42	44	40	39	39	41	44	45	46	50	43
1918	52	50	44	42	42	44	45	46	56	58	63	69	51
1919	62	52	62	64	58	52	53	55	59	68	71	72	61
1920	65	66	67	71	61	57	57	55	59	60	63	55	61
1921	52	47	48	46	32	33	40	43	43	47	45	44	43
1922	37	37	38	38	38	37	36	35	41	46	51	54	41
1923	52	50	49	40	42	39	39	44	46	48	53	55	47
1924	53	50	47	38	39	41	40	38	38	39	43	45	43
1925	40	41	48	45	43	42	43	43	48	51	51	49	45
1926	45	45	43	39	41	41	40	42	45	47	51	55	44
1927	49	52	50	50	43	43	42	42	46	48	50	52	47
1928	49	47	49	45	45	44	45	47	49	48	51	50	47
1929	48	50	48	45	44	44	42	43	46	46	43	41	45
1930	37	36	37	39	35	33	35	39	40	40	36	32	37
1931	28	28	29	26	24	23	25	28	32	34	31	31	28
1932	24	22	23	20	19	17	18	20	21	21	23	24	21
Chicago:													
1928	47	46	48	44	43	43	44	46	47	46	49	49	46
1929	47	49	48	44	42	42	41	42	45	44	41	39	44
1930	35	35	37	37	34	82	35	38	38	38	34	31	35
1931	27	27	29	24	22	22	24	27	30	32	30	29	27
1932	23	22	22	19	17	16	18	19	20	20	22	23	20
San Francisco:													
1928	46	45	43	40	42	43	46	48	50	51	49	50	46
1929	46	47	45	43	45	45	45	46	49	48	48	42	46
1930	36	38	38	39	37	34	34	37	39	37	34	33	36
1931	26	28	28	24	25	25	26	30	31	32	32	30	28
1932	24	24	23	20	19	18	19	21	21	22	26	27	22
Philadelphia:													
1928	50	48	50	46	46	45	46	48	50	49	52	51	48
1929	49	51	49	46	45	45	43	44	47	47	44	42	46
1930	38	36	38	40	36	84	36	40	41	41	37	33	38
1931	30	29	30	27	25	24	26	29	34	35	32	32	29
1932	25	23	24	21	20	18	19	21	22	22	24	25	22
Boston:													
1928	49	47	50	46	45	44	45	47	49	48	50	50	48
1929	48	50	49	46	44	44	43	44	46	46	43	41	45
1930	37	36	38	39	35	33	36	39	40	40	36	33	37
1931	29	29	29	27	24	24	25	28	32	34	31	31	29
1932	24	23	23	21	19	18	19	21	21	21	24	25	22

Bureau of Agricultural Economics. Compiled from Urner-Barry reports, 1910–1917 (New York), average of daily range; subsequently from reports of bureau representatives in the markets. These wholesale prices are based on open market sales made for cash or short-time credit, consideration being given to the prices at which the larger quantities are sold. Earlier data available in 1925 Yearbook, p. 1094, 1927 Yearbook, p. 1082, and 1931 Yearbook, p. 921.

TABLE 400.—*Butter: Average export price per pound in Copenhagen, Denmark, 1923–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	40.5	41.3	41.0	34.5	29.5	29.3	30.7	34.7	40.3	38.9	39.4	41.4	36.8
1924	40.0	39.5	36.9	31.3	36.4	33.4	37.8	41.1	42.3	46.1	44.2	46.8	39.6
1925	42.0	45.4	46.1	40.6	36.9	39.4	40.5	44.2	45.7	46.5	44.6	37.8	42.5
1926	36.5	40.2	38.8	36.2	34.8	35.7	35.4	36.1	36.6	36.3	34.9	37.1	36.6
1927	36.4	39.3	36.8	35.2	32.9	33.2	32.2	35.0	39.6	39.4	41.2	38.0	36.6
1928	35.4	37.5	40.0	36.6	35.4	34.9	36.4	38.0	40.2	39.5	40.6	42.4	38.1
1929	39.1	39.0	35.5	32.8	33.4	35.1	35.3	35.6	39.7	40.5	38.7	35.8	36.7
1930	32.0	35.3	31.7	27.4	26.3	27.7	30.3	29.2	29.9	30.1	27.2	27.3	29.5
1931	26.7	29.5	27.0	24.3	23.3	23.3	23.2	24.5	24.5	21.2	19.9	18.8	23.8
1932	16.7	19.8	17.2	15.6	13.6	13.2	14.8	14.0	15.7	14.7	14.5	13.7	15.3

Bureau of Agricultural Economics. Danish Butter Journal (Smor Tidende) official quotations. For earlier years, 1882–1922, see the United States Department of Agriculture Yearbook, 1923, p. 923.

Conversions from Danish quotations January, 192. to December, 1926, inclusive, and September, 1931, to date from weekly quotations in kroner per 100 kilogram, at average monthly exchange rate as quoted by Federal Reserve Board. Beginning January, 1927, to August, 1931, at par of exchange.

TABLE 401.—*Butter, creamery: Average wholesale*[1] *prices per pound, all scores, by months, New York and Chicago, 1932*

NEW YORK

Month	93	92	91	90	89	88	87	86	Centralized car lots		
									90	89	88
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
January	24.53	23.59	23.23	22.88	22.38	21.99	21.42	......	22.85	22.38	21.98
February	23.34	22.46	22.24	22.08	21.88	21.63	21.32	......	21.67	21.38	21.13
March	23.53	22.61	22.40	22.31	22.06	21.73	21.40	......	......	......	......
April	20.99	20.08	19.69	19.67	19.29	19.00	......	......	19.70	......	......
May	19.84	18.84	18.46	17.85	17.44	16.93	15.94	......	17.85	17.33	15.54
June	17.99	16.09	16.54	16.09	15.50	14.76	14.28	......	16.10	15.50	14.76
July	19.18	18.18	17.89	17.57	16.95	16.46	16.09	......	17.56	16.95	16.44
August	21.31	20.31	19.81	19.06	18.38	17.85	17.48	......	19.04	18.38	17.84
September	21.76	20.76	20.21	19.03	18.26	17.70	17.26	......	19.02	18.26	17.76
October	21.72	20.72	20.21	19.19	18.67	18.15	17.60	......	19.18	18.65	18.15
November	24.30	23.30	22.77	21.99	21.29	20.66	17.50	......	21.97	21.29	20.65
December	25.09	24.11	23.71	23.24	22.81	22.43	......	......	23.22	22.85	22.42
Average	21.97	21.00	20.62	20.08	19.58	19.11	18.03	......	19.83	19.30	18.67

CHICAGO

Month	93	92	91	90	89	88	87	86	90	89	88
January	23.77	23.02	22.45	22.08	21.71	21.24	20.75	20.20	22.83	21.94	21.43
February	22.38	21.63	21.28	20.96	20.57	20.13	19.63	19.11	21.62	20.89	20.09
March	22.80	22.05	21.64	21.33	20.97	20.51	20.02	19.52	22.03	21.34	20.79
April	19.72	18.98	18.68	18.43	18.16	17.73	17.40	16.90	18.96	18.38	17.84
May	17.86	17.11	16.79	16.43	15.98	15.47	14.84	14.34	17.06	16.36	15.52
June	17.04	16.29	15.90	15.55	15.07	14.58	13.68	13.18	16.26	15.27	14.53
July	18.46	17.71	17.10	16.54	15.84	14.86	13.88	13.38	17.63	16.54	15.16
August	20.18	19.43	18.78	18.27	17.61	16.96	16.00	15.46	19.62	18.24	17.04
September	20.78	20.03	19.42	18.74	17.60	16.86	15.90	15.26	19.75	17.82	16.86
October	20.54	19.79	19.23	18.67	17.92	17.14	16.14	15.58	19.33	18.00	17.04
November	22.85	22.10	21.60	20.80	20.05	19.22	18.22	17.61	21.42	20.37	19.24
December	23.42	22.67	22.32	21.93	21.56	21.04	20.31	19.60	22.25	21.03	21.03
Average	20.82	20.07	19.60	19.14	18.59	17.98	17.23	16.68	19.90	18.90	18.05

Bureau of Agricultural Economics.

[1] Principally sales by first-hand receivers to jobbers, chain stores, or other large distributors, in less-than carload lots, except as otherwise indicated.

TABLE 402.—*Cheese, whole milk American Cheddar: Production in the United States, 1920–1931*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1922	12,837	13,927	18,774	21,740	31,349	36,254	33,265	29,496	25,581	25,785	18,382	15,416	282,806
1923	15,092	15,326	20,184	24,014	32,942	41,382	38,288	31,822	28,648	25,566	18,236	16,608	308,108
1924	17,718	16,886	22,955	24,597	33,657	43,517	40,716	33,602	30,539	26,210	17,252	15,046	324,695
1925	16,834	17,991	21,598	26,889	38,012	45,782	43,706	37,659	31,548	28,253	20,349	18,619	347,240
1926	19,519	19,984	25,216	29,221	36,598	46,320	40,164	33,239	28,809	23,164	16,386	15,295	335,915
1927	16,660	17,085	21,318	24,533	34,704	41,489	38,195	31,944	25,783	23,012	16,717	16,337	307,777
1928	18,010	19,005	23,451	28,221	37,324	45,012	40,072	34,229	30,342	25,134	18,013	16,440	335,253
1929	19,925	19,522	24,059	30,181	42,483	51,702	48,007	37,811	30,824	25,961	19,655	20,184	370,314
1930	23,866	23,031	28,502	34,143	48,545	53,887	45,582	33,555	26,705	23,581	18,781	18,838	378,816
1931	21,941	22,018	27,571	32,940	44,439	49,513	40,595	32,956	29,139	30,470	23,016	20,050	374,648

Bureau of Agricultural Economics. The 1929, 1930, and 1931 statistics are the most complete since these reports were inaugurated in 1918. Some allowance, therefore, should be made for this when comparing production of those years with that of previous years.

TABLE 403.—*Cheese, whole-milk American Cheddar: Production, United States by States, average 1925–1929, annual 1930–31*

State	Average, 1925–1929	1930	1931	State	Average, 1925–1929	1930	1931
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*		*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Vermont	836	1,399	201	South Atlantic	510	858	623
Other New England States	91	85	83	Tennessee	751	2,518	2,347
New England	927	1,484	284	Others	2,099	6,378	6,968
New York	30,429	29,219	26,299	East South Central	2,850	8,896	9,315
New Jersey		307					
Pennsylvania	1,643	1,749	1,722	West South Central	954	4,203	5,965
Middle Atlantic	32,072	31,275	28,021	Wyoming	2,105	2,519	1,596
				Idaho	7,557	8,301	4,855
Ohio	575	1,000	1,156	Utah	2,230	2,904	3,083
Indiana	3,001	11,243	13,731	Montana	1,687	1,567	1,605
Illinois	3,662	5,132	4,390	Others	1,747	2,944	2,283
Michigan	6,984	6,476	6,662				
Wisconsin	239,647	246,686	243,109	Mountain	15,326	18,235	13,422
East North Central	253,869	270,537	269,048	Washington	3,527	4,945	5,284
				Oregon	11,297	14,727	15,777
Minnesota	9,020	9,086	8,432	California	3,939	2,947	7,117
Iowa	589	894	1,060				
Missouri	1,573	3,248	3,344	Pacific	18,763	22,619	28,178
Others	2,847	7,481	6,956	Total	339,300	378,816	374,648
West North Central	14,029	20,709	19,792				

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau

TABLE 404.—*Cheese: Receipts, gross weight,[1] at five markets, by months, specified years*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
New York:													
1930	4,094	4,212	3,660	3,977	4,934	6,247	4,956	4,368	4,661	3,881	3,676	3,499	52,165
1931	4,183	3,887	4,395	3,889	4,315	7,099	5,083	5,281	4,545	5,409	4,207	3,712	56,005
1932	4,996	5,158	4,611	3,945	5,134	5,702	6,590	5,850	4,626	4,887	4,902	4,794	61,195
Chicago:													
1930	5,378	4,949	5,066	5,001	5,586	5,702	5,980	5,577	4,906	4,024	3,491	3,206	58,866
1931	4,163	3,087	3,656	3,396	3,220	3,898	4,380	4,153	3,007	3,307	2,932	2,356	41,555
1932	3,177	3,284	3,178	3,201	3,723	4,061	3,942	4,065	3,635	4,230	3,170	3,138	42,804
Philadelphia:													
1930	1,214	1,295	1,927	1,461	1,929	2,268	2,279	1,709	2,214	1,790	1,542	1,539	21,167
1931	1,307	1,538	1,639	1,564	1,935	2,530	1,707	2,225	1,791	2,045	1,334	1,334	20,949
1932	1,434	1,629	1,521	1,618	2,221	2,498	1,973	2,094	1,969	1,590	2,134	1,400	22,081
Boston:													
1930	922	1,189	1,111	1,220	1,330	2,097	1,894	1,764	1,642	1,542	1,178	993	16,882
1931	1,213	1,144	1,155	1,438	1,432	2,427	1,552	1,404	1,734	1,673	1,116	952	17,240
1932	1,045	1,142	1,286	1,093	1,241	1,881	2,013	1,477	1,495	1,263	1,294	1,363	16,593
San Francisco:													
1930	918	821	1,140	1,367	1,694	1,581	2,326	1,536	1,087	988	896	766	15,119
1931	734	750	872	1,158	1,243	1,526	1,468	1,201	871	1,154	980	950	12,907
1932	710	862	1,163	908	1,653	1,588	1,974	1,369	1,046	1,359	1,005	712	14,349
Total:													
1923	13,063	12,617	15,354	16,433	18,963	25,406	25,764	21,680	18,619	21,325	16,557	13,256	219,037
1924	13,899	16,092	16,540	16,175	19,030	22,041	25,143	19,996	18,855	17,479	14,884	14,922	215,056
1925	15,202	12,845	14,898	15,436	18,529	24,025	25,825	24,176	20,520	21,029	17,059	14,012	223,556
1926	14,853	13,568	15,055	15,531	14,972	21,777	21,973	20,736	15,784	18,699	15,954	15,936	207,888
1927	12,707	14,916	14,956	16,922	21,301	22,134	24,134	22,556	21,532	18,996	14,278	13,526	218,248
1928	14,409	13,715	14,654	15,139	16,253	19,216	21,741	18,728	18,222	18,665	14,179	11,892	196,613
1929	13,781	13,877	12,261	12,331	16,750	18,406	20,548	18,605	15,289	14,343	11,829	10,879	178,899
1930	12,526	12,466	12,904	13,026	15,473	17,895	17,436	14,953	14,510	12,225	10,783	10,003	164,199
1931	11,600	10,406	11,717	11,445	12,145	17,480	14,190	14,264	11,948	13,588	10,569	9,304	148,656
1932	11,362	12,075	11,759	10,765	13,972	15,730	16,492	14,855	12,771	13,329	12,505	11,407	157,022

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. See 1927 Yearbook, p. 1084, and 1931 Yearbook, p. 924 for data for earlier years.

[1] Gross weight includes container and wrapping.

TABLE 405.—*Cheese: Receipts, gross weight,[1] at five markets, 1919–1932*

	New York	Chicago	Phila-delphia	Boston	San Fran-cisco		New York	Chicago	Phila-delphia	Boston	San Fran-cisco
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs*	*1,000 lbs.*		*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1919	65,045	81,019	21,392	17,722	12,089	1926	45,363	115,104	19,454	15,437	12,530
1920	47,004	81,597	16,868	12,997	10,203	1927	46,937	123,633	20,396	14,588	12,694
1921	51,981	85,849	20,952	13,208	9,632	1928	48,272	97,264	21,039	17,362	12,676
1922	50,109	167,724	19,324	13,521	9,157	1929	50,911	80,823	19,973	14,899	12,293
1923	49,425	123,645	18,363	15,914	11,090	1930	52,165	58,866	21,167	16,882	15,119
1924	42,959	130,024	16,866	13,725	11,482	1931	56,005	41,555	20,949	17,240	12,907
1925	46,163	131,129	19,095	15,314	11,855	1932	61,195	42,804	22,081	16,593	14,349

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 406.—*Cheese: Receipts, gross weight,[1] at five markets, by origin, 1928–1932*

Market and origin	1928	1929	1930	1931	1932
NEW YORK	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Ill.	5,132	4,497	6,145	7,288	9,196
Ind.	1,923	1,585	1,084	1,539	1,074
Iowa	178	82	84	28	122
Mass.	64	365	93	68	22
Mich.	837	937	844	704	1,377
Minn.	179	188	329	266	285
Mo.	123	7	13	30	94
Nebr.	42	52	45	115	63
N. J.	186	69	69	8	3
N. Y.	13,390	11,252	10,866	8,294	7,289
Ohio	646	678	617	576	592
Pa.	745	588	466	146	100
Vt.	16	33	43	(2)	6
Va.	24	220	1	(2)	(2)
Wis.	23,002	27,068	26,835	35,456	40,657
Other States	248	372	204	78	87
Canada	1,537	2,918	2,427	1,411	228
Total	48,272	50,911	52,165	56,005	61,195
BOSTON					
Ill.	1,845	1,754	1,387	1,404	784
Ind.	388	161	382	348	216
Me.	147	1	(2)	(2)	1
Mass.	65	37	38	25	2
Mich.	422	322	132	396	273
N. H.	2	1	5	1	12
N. Y.	3,787	2,847	2,349	2,310	2,226
Ohio	110	6	12	76	33
Pa.	56	10	60	1	2
Vt.	47	34	113	54	53
Wis.	9,953	9,260	9,492	11,746	12,825
Other States	353	407	2,910	876	163
Canada	187	59	2	3	3
Total	17,362	14,899	16,882	17,240	16,593
PHILADELPHIA					
Ill.	2,701	3,075	2,091	1,880	2,512
Ind.	110	137	34	146	4
Iowa	2	4	4	8	5
Mich.	499	539	655	668	75
Minn.	343	23	34	285	799
N. Y.	2,201	2,145	2,231	1,688	979
N. Dak.					2
Ohio	82	52	1	10	66
PHILADELPHIA—con.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Pa.	4	57	91	87	51
Wis.	14,735	13,825	15,966	15,945	17,666
Other States	196	41	60	237	
Canada	166	75			
Total	21,039	19,973	21,167	20,949	22,081
CHICAGO					
Calif.	45	56	37	45	2
Colo.	58	197	22	12	10
Ill.	2,900	1,994	1,853	943	4,213
Ind.	255	296	396	139	41
Iowa	296	278	98	76	43
Kans.	36	35	89	27	4
Mich.	137	192	246	49	93
Minn.	2,979	2,999	1,751	1,132	733
Mo.	563	161	24	20	33
Mont.		1	10	1	
N. J.	445	780	319	879	156
N. Y.	4,246	4,652	2,857	1,323	3,203
Ohio	176	111	136	9	46
Pa.	479	230	60	23	55
S. Dak.	9	29	16	28	10
Tex.	15	6	5	59	31
Wis.	82,954	67,495	49,447	36,424	33,796
Other States	1,084	685	683	333	326
Canada	567	606	867	33	
Total	97,264	80,823	58,866	41,555	42,804
SAN FRANCISCO					
Calif.	3,508	3,449	4,218	3,110	3,233
Colo.	225	179	165	129	81
Idaho	3,334	3,303	3,413	2,907	1,781
Ill.	91	3	221	(2)	83
Mont.	160	3	1		
N. Y.	572	734	784	687	337
Oreg.	2,877	3,374	5,427	5,093	6,568
Utah	30	59	28		9
Wash.	17	17	13	34	94
Wis.	1,820	1,136	759	904	2,210
Other States	42	36	95	43	3
Total	12,676	12,293	15,119	12,907	14,349

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping. [2] Not over 500 pounds.

TABLE 407.—*Cheese, American, and all varieties: Cold-storage holdings,*[1] *United States, 1923–1932*

AMERICAN[2]

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923	33, 617	26, 593	20, 693	14, 465	14, 077	17, 507	36, 834	55, 839	63, 960	62, 384	57, 927	55, 105
1924	49, 566	40, 506	35, 160	28, 294	26, 202	27, 172	45, 239	65, 864	76, 406	73, 153	67, 905	58, 705
1925	49, 187	41, 552	34, 647	27, 716	26, 147	29, 550	46, 468	66, 634	76, 512	78, 582	71, 913	66, 495
1926	58, 457	50, 339	42, 587	38, 041	35, 597	39, 346	54, 069	73, 681	81, 297	77, 646	72, 491	63, 881
1927	56, 758	48, 106	41, 383	37, 188	34, 332	37, 710	52, 085	69, 119	71, 825	67, 402	60, 766	55, 140
1928	49, 914	43, 837	38, 189	33, 294	32, 177	39, 203	56, 386	75, 862	86, 632	84, 745	85, 126	77, 258
1929	71, 177	60, 772	52, 665	48, 175	44, 983	50, 721	66, 640	83, 914	90, 863	89, 797	83, 737	76, 669
1930	68, 930	58, 972	53, 208	46, 507	43, 230	53, 403	74, 986	93, 773	92, 063	90, 152	83, 674	75, 736
1931	67, 599	58, 516	52, 304	45, 277	44, 792	46, 764	63, 156	73, 693	73, 740	70, 940	69, 611	66, 053
1932	60, 804	54, 360	47, 106	42, 009	38, 951	40, 461	53, 922	63, 667	66, 721	68, 555	66, 813	62, 392

ALL VARIETIES

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
1923	45, 234	37, 228	29, 516	21, 815	21, 192	26, 235	48, 728	70, 860	80, 663	78, 791	74, 302	72, 623
1924	67, 221	57, 232	50, 388	42, 413	40, 235	42, 644	61, 755	84, 073	95, 211	91, 282	88, 043	77, 594
1925	67, 558	58, 461	50, 117	40, 480	39, 037	42, 888	61, 992	83, 568	95, 472	97, 777	90, 866	84, 561
1926	76, 649	67, 531	58, 175	51, 285	47, 450	52, 167	68, 771	90, 053	98, 473	95, 385	89, 785	81, 084
1927	74, 217	64, 216	56, 073	49, 835	47, 461	52, 748	69, 302	89, 965	92, 280	87, 060	79, 334	72, 428
1928	66, 184	57, 906	50, 263	44, 710	43, 761	51, 477	71, 353	92, 482	104, 224	101, 251	100, 229	92, 903
1929	88, 832	77, 024	67, 087	61, 223	57, 569	64, 177	83, 627	102, 077	110, 314	107, 831	100, 558	92, 553
1930	86, 075	74, 523	67, 281	59, 928	56, 940	72, 358	95, 221	113, 923	112, 061	108, 767	101, 148	91, 775
1931	83, 288	73, 488	66, 177	57, 711	57, 422	60, 242	77, 989	89, 264	91, 284	88, 564	87, 386	84, 035
1932	78, 318	70, 682	60, 962	54, 021	50, 764	52, 118	66, 531	76, 327	79, 847	81, 406	78, 274	73, 916

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments. Changes in these tables made due to transferrence of current trading stocks to cold storage stocks from Jan. 1, 1927, to Dec. 1, 1931.

[1] Quantities given are net weight.
[2] The term "American cheese" is intended to cover only those varieties known as twins, flats, daisies, Cheddars, longhorns, and square prints. It does not, therefore, include all kinds of cheese made in America.

TABLE 408.—*Cheese, No. 1 American, fresh single daisies: Average wholesale price per pound, New York, by months, 1924–1932*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cnets*	*Cents*	*Cents*	*Cents*	*Cents*
1924	24	24	23	20	19	20	20	21	21	21	21	22	21
1925	24	24	24	24	24	24	24	24	24	25	[1] 25	25	24
1926	26	25	23	21	21	21	22	22	23	24	25	26	23
1927	26	26	25	24	24	24	24	25	27	28	27	29	26
1928	------	[1] 25	25	24	24	26	26	26	27	26	25	25	[2] 25
1929	25	24	24	24	23	23	23	23	24	24	24	23	24
1930	21	21	21	21	20	18	18	19	20	19	19	18	20
1931	17	16	16	15	14	14	15	16	17	16	15	14	15
1932	13	13	13	12	12	11	12	14	14	13	13	13	13

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the market. These wholesale prices are based upon open market sales made for cash or short-time credit, consideration being given to the prices at which the larger quantities are sold.

[1] Less than 10 quotations during month. [2] Based on 11 months' quotations.

Table 409.—*Cheese: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Netherlands	198, 943	1, 292	202, 999	1, 484	211, 234	1, 445	206, 735	1, 509	190, 458	1, 345
New Zealand	171, 975	4	175, 534	1	199, 258	6	203, 054	7	183, 271	5
Canada	120, 606	3, 419	114, 153	1, 779	92, 946	2, 104	80, 164	1, 798	84, 788	1, 446
Italy	78, 435	9, 818	80, 466	10, 206	72, 454	13, 975	80, 973	12, 562	89, 045	10, 115
Switzerland	64, 236	3, 538	62, 695	3, 306	69, 726	3, 437	66, 143	4, 238	54, 305	8, 470
Denmark	14, 740	972	13, 417	864	14, 513	647	12, 625	808	9, 383	603
Czechoslovakia	7, 843	2, 450	7, 922	2, 625	7, 052	3, 348	8, 274	2, 961	10, 981	3, 776
Australia [2]	6, 724	1, 212	9, 262	1, 007	5, 131	548	7, 263	154	....	....
Finland	5, 951	42	3, 634	39	4, 836	44	4, 682	35	5, 777	0
Yugoslavia	4, 787	318	4, 132	325	4, 937	870	4, 583	207	4, 197	243
Bulgaria	2, 150	18	1, 932	15	2, 642	11	2, 466	5	3, 131	0
Hungary	1, 870	1, 720	1, 398	1, 782	1, 704	1, 536	1, 846	955	920	496
Russia [2]	1, 390	110	1, 922	0	3, 091	0	697	0	....	0
Total	676, 750	24, 913	679, 466	23, 523	689, 524	27, 471	679, 505	25, 319	636, 256	26, 499
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	4, 509	331, 101	5, 852	333, 182	6, 388	331, 744	5, 570	345, 227	4, 047	310, 795
Germany	3, 311	149, 025	3, 664	135, 530	4, 919	146, 569	5, 411	137, 458	7, 372	120, 403
United States	4, 350	75, 680	2, 000	81, 403	2, 645	76, 382	1, 964	68, 311	1, 673	61, 901
Belgium	1, 173	38, 709	914	39, 148	892	46, 399	875	52, 048	813	49, 600
France	31, 257	37, 037	35, 122	36, 694	34, 110	42, 899	32, 694	55, 036	33, 259	82, 810
Algeria	220	7, 496	185	8, 821	193	8, 449	212	10, 464	197	11, 182
Spain	89	7, 109	91	8, 667	67	6, 970	207	5, 835	237	3, 866
Austria	1, 769	7, 056	2, 461	6, 401	2, 936	5, 716	4, 493	5, 636	6, 235	5, 794
Egypt	152	6, 870	155	7, 085	195	6, 526	121	7, 494	129	7, 311
Cuba	5	4, 764	12	4, 163	6	4, 484	10	2, 867	....	....
Greece	40	3, 942	21	2, 298	[2] 178	3, 314	[2] 263	2, 301	....	3, 959
Argentina	861	3, 681	764	4, 344	796	4, 000	744	3, 777	1, 055	1, 659
Irish Free State	271	2, 567	133	2, 449	124	2, 409	169	2, 350	0	2, 689
Dutch East Indies	0	1, 681	0	1, 938	0	2, 347	0	2, 161	[3] 0	[3] 1, 658
Mexico	126	1, 808	124	1, 714	[2] 135	1, 744	[2] 56	1, 230	....	....
Brazil	0	1, 472	0	1, 763	0	1, 555	0	1, 246	1	575
Sweden	474	1, 405	145	1, 501	263	1, 413	550	1, 473	102	1, 091
Tunis	21	1, 347	46	1, 430	13	1, 683	28	1, 764	24	1, 943
British India	6	1, 231	6	1, 218	7	1, 257	7	1, 148	6	899
Norway	925	1, 191	927	1, 004	1, 347	841	1, 380	740	2, 839	562
Union of South Africa	342	530	298	734	404	669	1, 954	450	2, 186	303
Total	49, 901	685, 902	53, 520	681, 577	55, 618	697, 370	56, 717	709, 025	60, 175	678, 690

Bureau of Agricultural Economics. Official sources except where otherwise noted. All cheese made from milk, including cottage cheese.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Java and Madura only.

Table 410.—*Oleomargarine: Production and apparent consumption in the United States, 1924–25 to 1931–32*

Year beginning July—	Production			Stocks beginning of year	Exports	Stocks end of year	Apparent consumption	
	Colored	Uncolored	Total				Total	Per capita
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Pounds*
1924–25	11, 280	204, 123	215, 403	2, 607	687	2, 720	214, 403	1. 87
1925–26	13, 181	234, 866	248, 047	2, 720	1, 256	2, 942	246, 569	2. 12
1926–27	14, 502	242, 655	257, 157	2, 942	942	3, 299	255, 858	2. 17
1927–28	15, 351	279, 348	294, 699	3, 299	732	3, 187	294, 079	2. 46
1928–29	16, 306	316, 816	333, 122	3, 187	633	4, 191	331, 485	2. 74
1929–30	17, 103	332, 021	349, 124	4, 191	931	4, 702	347, 682	2. 84
1930–31	8, 847	268, 926	277, 773	4, 694	604	2, 494	279, 369	2. 26
1931–32	4, 636	210, 706	215, 342	2, 494	553	2, 628	214, 655	1. 72

Bureau of Agricultural Economics. Production and stocks from reports of the Bureau of Internal Revenue. Exports from reports of the Bureau of Foreign and Domestic Commerce. See 1927 Yearbook, p. 1068, for data for earlier years.

TABLE 411.—*Oleomargarine: Materials used in manufacture, 1922–23 to 1931–32*

Material	Year beginning July									
	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Butter	1,576	1,900	1,509	2,330	2,070	2,484	2,611	2,616	1,013	39
Coconut oil	65,656	83,059	79,449	98,307	107,654	141,000	171,412	185,966	155,954	127,967
Coloring	11	26	38	41	18	19	47	21	11	5
Corn oil		457	196	174	183	38		(1)	159	74
Cottonseed oil	18,757	20,640	20,966	25,608	23,372	24,801	28,173	30,214	22,037	14,874
Edible tallow		24	111	93	219	70	26	16	(1)	
Milk	59,835	60,090	61,924	72,662	73,700	83,115	94,752	97,753	77,251	54,257
Mustard-seed oil		38	27	34	53	56	12	48	48	1
Neutral lard	29,568	32,210	25,674	25,172	24,872	25,036	24,189	19,632	10,180	10,557
Oleo oil	46,645	52,265	44,102	47,418	48,741	45,477	47,185	45,322	28,040	15,315
Oleo stearine	4,815	5,317	5,250	5,314	5,145	5,532	5,834	6,269	5,485	4,337
Oleo stock	2,322	2,756	3,183	3,082	2,552	1,738	1,294	1,189	1,025	641
Peanut oil	6,922	5,656	4,392	5,257	4,872	5,459	6,617	5,714	5,291	3,780
Salt	17,998	20,593	18,725	20,593	21,683	25,024	27,311	28,890	22,981	14,659
Soybean oil				1	33			619	2,262	13
Miscellaneous	2,918	432	688	1,374	918	1,220	1,474	1,279	3,154	840
Total	257,023	294,463	266,234	307,460	316,085	361,069	410,937	424,648	334,891	247,365

Bureau of Agricultural Economics. Compiled from annual reports of the Bureau of Internal Revenue.

[1] Not over 500 pounds.

TABLE 412.—*Oleomargarine, standard, uncolored: Average wholesale price per pound, Chicago, by months, 1923–1932* [1]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	21.0	21.5	22.2	22.5	20.9
1924	22.5	22.5	21.9	20.5	20.5	20.5	21.2	22.5	22.5	23.0	24.0	24.5	22.2
1925	24.5	24.5	24.5	24.5	23.9	23.5	23.7	24.5	24.5	24.5	24.5	24.5	24.3
1926	24.5	24.3	23.5	23.3	22.5	22.5	22.5	22.5	22.5	22.5	21.8	21.5	22.8
1927	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	23.9	24.5	23.5	23.5	22.3
1928	23.5	23.5	23.5	21.5	21.5	21.5	21.5	21.5	22.0	23.5	23.5	23.5	22.5
1929	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5
1930	23.5	23.5	23.5	23.5	23.5	22.8	20.5	20.5	20.5	20.5	20.5	19.0	21.8
1931	17.7	15.5	14.5	14.5	12.8	11.0	10.6	10.5	11.9	12.7	13.3	13.4	13.3
1932	12.8	9.8	9.5	9.5	9.5	9.5	9.1	9.3	9.5	9.5	9.5	9.5	9.7

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics Wholesale Price Bulletins.

[1] These prices are for consignment to the wholesale trade.

TABLE 413.—*Chickens: Number on hand January 1 and value, United States 1925–1932*

Year	Number	Price per head	Total value	Year	Number	Price per head	Total value
	Thousands	*Cents*	*1,000 dollars*		*Thousands*	*Cents*	*1,000 dollars*
1925 census	409,291	92.6	379,011	1930 [1] census	378,878	84.9	321,625
1925	417,755	79.3	331,203	1930	469,955	92.8	436,272
1926	424,514	88.5	375,628	1931	460,489	70.4	324,406
1927	450,565	90.7	408,525	1932	451,219	61.7	278,208
1928	467,174	85.8	401,004	1933	461,365	45.1	208,012
1929	445,806	91.1	406,164				

Bureau of Agricultural Economics.

[1] As of Apr. 1.

Table 414.—*Chickens: Estimated number and value per head on farms, by States, January 1, 1930–1933*

State and division	Number chickens Jan. 1				Value per head			
	1930	1931	1932	1933	1930	1931	1932	1933
	Thous.	*Thous.*	*Thous.*	*Thous.*	*Cents*	*Cents*	*Cents*	*Cents*
Maine	1,800	1,800	1,780	1,900	155	125	110	88
New Hampshire	1,130	1,110	1,090	1,160	160	130	120	95
Vermont	890	855	827	868	140	115	105	88
Massachusetts	2,320	2,245	2,190	2,215	170	140	125	105
Rhode Island	368	359	350	374	175	135	125	105
Connecticut	1,850	1,835	1,960	2,015	165	120	105	90
New York	14,620	14,200	14,340	14,765	126	103	97	81
New Jersey	5,680	5,080	5,525	5,840	148	125	112	94
Pennsylvania	19,550	19,380	18,900	19,830	128	98	93	68
North Atlantic	48,208	46,864	46,962	48,967	135.5	107.7	100.2	79.7
Ohio	21,950	21,795	21,375	22,895	101	75	67	47
Indiana	17,850	17,480	17,200	17,830	97	71	64	45
Illinois	27,900	26,780	26,020	26,870	101	73	63	45
Michigan	11,540	11,650	12,295	12,835	105	81	71	50
Wisconsin	14,620	15,610	14,800	14,930	97	72	61	47
East North Central	93,860	93,315	91,690	95,360	100.1	73.9	64.9	46.5
Minnesota	19,100	19,040	19,170	19,160	80	63	51	35
Iowa	35,600	35,030	34,150	33,375	85	66	56	43
Missouri	30,000	28,420	27,170	28,320	86	60	54	36
North Dakota	5,609	5,250	4,830	5,005	70	52	47	32
South Dakota	10,180	10,060	9,125	9,490	74	57	51	34
Nebraska	17,060	16,990	15,810	15,980	78	57	47	34
Kansas	22,770	22,410	21,590	21,785	80	54	40	34
West North Central	140,379	137,200	131,845	133,615	81.5	60.1	51.5	36.8
North Central	234,239	230,515	223,535	228,975	88.9	65.7	57.0	40.8
Delaware	2,020	2,000	1,970	1,745	115	90	82	59
Maryland	5,030	4,925	5,225	5,345	112	90	78	57
Virginia	9,780	9,420	9,720	10,365	99	72	68	45
West Virginia	4,400	4,230	3,965	4,220	97	71	63	47
North Carolina	8,870	8,670	8,960	9,560	85	70	59	39
South Carolina	4,159	4,185	4,060	4,270	77	71	57	45
Georgia	7,660	7,710	7,935	7,795	76	64	62	40
Florida	2,600	2,670	2,785	2,745	88	85	70	58
South Atlantic	44,519	43,810	44,620	46,045	91.6	73.6	63.8	45.8
Kentucky	11,790	10,690	10,425	11,085	88	60	54	35
Tennessee	12,180	11,225	10,880	11,775	81	57	51	33
Alabama	7,640	7,640	7,545	7,840	76	54	44	35
Mississippi	7,800	7,215	7,420	7,625	80	57	47	35
Arkansas	8,748	7,480	8,170	8,820	70	47	43	30
Louisiana	5,510	5,170	5,075	4,750	85	63	57	38
Oklahoma	14,740	13,540	13,085	14,100	75	54	48	30
Texas	26,900	26,320	26,830	27,680	73	56	47	32
South Central	95,308	89,280	89,430	93,675	77.4	55.9	48.4	32.8
Montana	2,490	2,400	2,190	2,260	80	60	53	42
Idaho	2,450	2,740	2,650	2,450	84	62	52	40
Wyoming	910	885	870	840	88	68	53	44
Colorado	4,570	4,440	4,110	4,000	79	63	52	34
New Mexico	1,220	1,135	1,145	1,240	77	62	59	41
Arizona	770	770	760	810	105	86	71	63
Utah	2,550	3,036	2,795	2,180	87	70	53	46
Nevada	291	344	327	253	110	90	62	60
Washington	7,760	7,915	7,620	7,645	99	70	65	55
Oregon	3,370	3,455	3,565	3,415	99	80	72	53
California	21,300	22,900	20,640	18,610	114	95	80	64
Western	47,681	50,020	46,672	43,703	100.8	80.8	68.7	54.4
United States	469,955	460,480	451,219	461,365	92.8	70.4	61.7	45.1

Bureau of Agricultural Economics.

Table 415.—*Chickens: Number raised and value, United States, 1925–1932*

Year	Number	Price per head	Total value	Year	Number	Price per head	Total value
	Thousands	*Cents*	*1,000 dollars*		*Thousands*	*Cents*	*1,000 dollars*
1925 census	545,845	76.83	419,381	1929	673,090	77.9	524,396
				1930 census	673,092	86.33	581,110
1925	607,764	72.0	437,363				
1926	643,649	76.3	491,370	1930	653,101	63.2	412,904
1927	672,123	71.9	483,430	1931	629,488	55.9	351,674
1928	627,352	76.7	481,362	1932	654,927	40.8	266,803

[illegible]ltural Economics.

TABLE 416.—*Chickens: Number raised and value per head, by States, 1929–1932*

State and division	Number raised				Value per head			
	1929	1930	1931	1932	1929	1930	1931	1932
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Cents*	*Cents*	*Cents*	*Cents*
Maine	3, 238	3, 400	3, 380	3, 650	107	97	89	69
New Hampshire	2, 679	2, 540	2, 640	2, 640	109	95	87	68
Vermont	1, 378	1, 350	1, 380	1, 520	104	94	84	64
Massachusetts	5, 088	4, 830	5, 120	5, 530	111	93	87	66
Rhode Island	808	640	640	685	125	104	95	78
Connecticut	3, 510	3, 615	3, 795	3, 795	112	104	90	74
New York	19, 518	19, 520	18, 555	21, 336	94	80	72	59
New Jersey	7, 995	6, 800	7, 480	7, 855	122	102	96	76
Pennsylvania	25, 640	24, 610	23, 640	24, 800	104	84	78	62
North Atlantic	69, 654	67, 305	66, 630	71, 811	104. 7	87. 8	80. 9	64. 4
Ohio	32, 575	31, 275	29, 710	32, 085	88	71	62	44
Indiana	29, 048	29, 340	27, 280	29, 190	86	67	60	45
Illinois	38, 125	36, 600	35, 140	37, 250	89	71	64	46
Michigan	18, 146	18, 510	18, 510	18, 880	89	72	60	45
Wisconsin	19, 960	21, 756	20, 016	19, 610	79	62	56	38
East North Central	137, 854	137, 481	130, 656	137, 015	86. 7	68. 9	60. 9	44. 0
Minnesota	26, 979	27, 790	27, 790	27, 235	74	60	52	35
Iowa	48, 216	47, 250	45, 830	44, 455	85	68	62	43
Missouri	40, 783	38, 340	34, 890	39, 430	78	59	52	36
North Dakota	8, 177	7, 359	6, 990	6, 920	66	50	45	32
South Dakota	14, 659	13, 190	13, 085	12, 430	77	60	52	36
Nebraska	25, 974	24, 676	22, 950	23, 640	72	57	51	37
Kansas	33, 650	33, 310	31, 645	33, 225	70	55	48	34
West North Central	198, 438	191, 915	183, 180	187, 335	76. 4	60. 1	53. 4	37. 1
North Central	336, 292	329, 396	313, 836	324, 350	80. 6	63. 8	56. 5	40. 1
Delaware	3, 414	3, 280	2, 950	2, 655	98	77	67	49
Maryland	7, 422	7, 050	7, 050	7, 755	93	78	72	51
Virginia	16, 728	16, 390	16, 550	19, 030	72	58	56	37
West Virginia	5, 504	5, 390	4, 905	6, 130	79	64	61	40
North Carolina	14, 727	13, 255	13, 650	15, 015	64	57	47	35
South Carolina	7, 447	7, 075	7, 360	7, 730	64	60	51	37
Georgia	12, 264	11, 405	11, 635	11, 635	65	55	46	33
Florida	3, 421	3, 250	3, 410	3, 070	79	71	58	50
South Atlantic	70, 927	67, 095	67, 510	73, 020	72. 6	61. 6	54. 5	38. 7
Kentucky	17, 356	15, 620	14, 530	16, 855	69	53	49	34
Tennessee	15, 939	14, 664	14, 224	15, 930	67	52	47	33
Alabama	10, 733	11, 055	10, 500	11, 340	59	49	37	27
Mississippi	10, 712	10, 284	10, 180	10, 405	56	49	37	30
Arkansas	11, 202	9, 860	10, 845	11, 725	65	48	43	29
Louisiana	7, 279	5, 825	5, 825	5, 650	67	56	48	34
Oklahoma	23, 292	20, 497	20, 497	22, 135	64	50	45	30
Texas	36, 275	34, 460	34, 400	35, 840	60	48	41	29
South Central	132, 788	122, 265	121, 061	129, 880	63. 1	50. 0	43. 2	30. 4
Montana	3, 684	3, 610	3, 610	3, 680	64	55	48	40
Idaho	3, 371	3, 907	3, 427	3, 015	67	55	48	34
Wyoming	1, 258	1, 320	1, 400	1, 190	70	58	47	38
Colorado	6, 333	5, 825	5, 245	5, 040	67	56	47	35
New Mexico	1, 486	1, 380	1, 450	1, 670	68	59	50	40
Arizona	997	997	947	995	66	77	72	59
Utah	3, 540	4, 248	3, 611	2, 890	67	51	42	36
Nevada	439	527	448	336	80	74	65	47
Washington	11, 063	10, 842	10, 083	11, 090	65	52	50	35
Oregon	4, 613	5, 074	5, 330	4, 795	69	60	52	40
California	26, 645	29, 310	24, 900	21, 165	76	69	55	47
Western	63, 429	67, 040	60, 451	55, 866	70. 9	61. 5	51. 7	41. 0
United States	673, 090	653, 101	629, 488	654, 927	77. 9	63. 2	55. 9	40. 8

Bureau of Agricultural Economics.

TABLE 417.—*Poultry, live: Freight receipts at New York, by origin, 1928–1932*

State	1928	1929	1930	1931	1932	State	1928	1929	1930	1931	1932
	Cars	*Cars*	*Cars*	*Cars*	*Cars*		*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Alabama	176	181	129	166	151	New Jersey	----	----	1	----	----
Arkansas	410	369	349	359	290	New Mexico	4	13	2	----	----
Colorado	89	86	82	24	17	New York	1	1	----	----	----
Delaware	----	----	1	----	----	North Carolina	158	240	107	63	50
Florida	----	2	4	3	4	North Dakota	33	57	55	76	48
Georgia	151	179	79	62	35	Ohio	343	335	305	335	461
Illinois	874	880	1,174	978	851	Oklahoma	873	835	763	728	445
Indiana	842	963	1,168	942	1,051	Pennsylvania	36	44	12	8	4
Iowa	586	354	604	732	598	South Carolina	41	125	49	59	44
Kansas	474	422	509	447	430	South Dakota	313	273	214	300	271
Kentucky	741	397	511	593	598	Tennessee	1,060	884	642	857	690
Louisiana	1	----	----	----	12	Texas	436	348	332	233	183
Maryland	----	----	2	1	----	Utah	----	4	----	----	----
Massachusetts	1	----	----	----	----	Virginia	68	56	91	96	66
Michigan	6	6	----	----	2	Wisconsin	219	175	188	192	68
Minnesota	164	131	123	187	58	Wyoming	5	13	4	1	----
Mississippi	188	90	76	75	60	Other States	----	----	----	----	----
Missouri	1,896	1,874	2,019	1,650	1,839						
Nebraska	1,078	1,156	1,082	985	802	United States	11,267	10,493	10,677	10,152	9,126

Bureau of Agricultural Economics.

TABLE 418.—*Poultry, dressed: Receipts, gross weight,[1] at four markets, by months, 1928–1932; totals, 1923–1932*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Boston:													
1928	4,591	3,756	4,137	2,877	3,285	3,290	3,899	3,468	3,555	4,680	7,716	10,329	55,583
1929	4,586	3,231	2,315	2,855	2,718	3,369	3,153	3,628	4,309	5,048	8,828	10,395	54,433
1930	4,270	3,992	2,815	2,544	3,193	3,514	3,401	2,952	3,154	3,875	8,270	9,309	51,289
1931	4,840	4,565	3,846	2,976	2,559	3,216	3,476	3,635	3,787	4,434	9,698	10,750	57,782
1932	4,141	3,927	4,094	2,730	2,967	3,255	2,839	3,487	3,619	4,295	10,633	12,256	58,213
New York:													
1928	14,999	11,064	9,322	9,703	10,628	11,127	13,252	13,850	14,332	21,799	31,846	32,454	194,376
1929	14,221	10,900	9,964	9,520	10,233	11,876	13,078	15,707	16,558	20,602	31,495	32,903	197,057
1930	15,054	11,674	8,476	10,630	13,877	14,999	11,807	12,533	15,383	19,647	32,584	34,221	200,885
1931	17,969	13,396	9,920	10,073	10,553	13,657	15,242	18,294	21,147	18,749	33,029	36,882	218,911
1932	12,534	9,910	10,292	8,852	11,454	13,728	12,708	14,288	15,362	19,651	34,609	32,057	195,445
Philadelphia:													
1928	2,373	1,601	1,885	1,359	1,558	2,177	1,931	1,763	2,097	2,965	4,925	7,210	31,844
1929	2,548	1,851	1,680	1,471	1,557	1,663	2,134	2,319	2,302	2,542	6,002	8,595	34,664
1930	3,041	2,501	2,207	1,991	2,388	2,117	1,794	1,772	2,166	3,046	5,607	7,906	36,536
1931	2,384	2,179	2,863	1,754	1,580	2,509	2,729	2,875	2,555	2,524	6,018	8,243	38,193
1932	1,681	2,467	1,943	1,960	2,555	1,934	1,912	2,191	2,096	2,614	6,259	8,635	36,447
Chicago:													
1928	6,639	3,591	2,216	1,876	2,137	1,977	2,771	2,829	3,580	5,719	15,301	18,544	67,180
1929	7,712	3,469	2,707	2,725	2,811	3,270	3,520	3,984	4,710	9,070	25,578	23,812	93,368
1930	9,835	5,597	2,899	2,339	2,163	2,645	2,303	2,777	3,809	6,274	19,409	20,103	80,153
1931	7,770	4,529	3,563	2,320	2,309	2,501	3,130	3,673	4,642	4,397	14,203	18,438	71,475
1932	4,855	3,317	2,396	1,505	1,428	1,826	853	1,616	3,333	6,232	19,736	19,752	65,349
Total:													
1923	43,123	22,858	16,752	12,436	13,210	16,205	16,863	17,794	18,399	28,087	56,018	73,100	334,845
1924	37,150	26,395	20,344	15,182	17,319	17,862	19,572	17,543	19,868	26,982	60,445	78,068	356,730
1925	27,585	19,383	15,048	13,323	16,166	17,487	17,676	17,466	18,683	27,259	61,488	66,794	318,358
1926	26,122	18,576	17,344	13,809	16,371	21,099	20,724	22,932	24,278	30,738	68,594	75,228	355,816
1927	26,652	18,119	15,362	13,772	19,853	21,015	17,789	22,376	23,935	28,710	60,422	68,974	336,979
1928	28,602	20,012	17,560	15,815	17,608	18,571	21,853	21,910	23,564	35,163	59,788	68,537	348,983
1929	29,067	19,451	16,666	16,571	17,319	20,178	21,885	25,638	27,879	37,262	71,901	75,705	379,522
1930	32,200	23,764	16,397	17,504	21,621	23,275	19,305	20,034	24,512	32,842	65,870	71,539	368,863
1931	32,963	24,669	20,192	17,123	16,981	21,883	24,577	28,477	32,131	30,104	62,948	74,313	386,361
1932	23,411	19,621	18,725	15,047	18,404	20,243	18,312	21,582	24,410	31,762	71,237	72,700	355,454

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 419.—*Poultry, dressed: Receipts, gross weight,[1] at four markets, by origin, 1928–1932*

Market and origin	1928	1929	1930	1931	1932
BOSTON	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Ill	11,719	10,651	10,497	9,284	8,909
Ind	5,368	3,200	3,677	3,296	3,270
Iowa	6,648	7,609	7,495	8,917	9,109
Kans	4,557	4,917	2,155	3,774	3,495
Ky	204	141	365	227	312
Me	509	500	479	319	313
Mass	85	27	37	5	5
Mich	888	663	515	424	466
Minn	6,860	6,786	9,024	9,502	5,835
Mo	1,881	2,722	2,328	2,100	3,126
Nebr	3,298	3,163	3,950	3,763	3,233
N. H	17	15	25	13	18
N. Y	1,709	757	1,008	942	429
N. Dak	478	1,473	1,521	2,678	5,575
Ohio	390	140	84	254	258
Okla	2,662	1,364	1,215	1,369	1,474
Pa	104	1	21	200	126
S. Dak	114	559	377	1,541	2,723
Tenn	330	510	173	323	590
Tex	5,034	6,693	5,470	7,099	6,937
Vt	28	31	31	31	25
Wis	932	266	94	322	31
Other States	1,761	2,245	742	1,250	1,756
Canada	7	-------	-------	149	198
Total	55,583	54,433	51,280	57,782	58,213
NEW YORK					
Ark	40	442	532	337	703
Calif	1,117	1,753	1,476	1,668	1,707
Colo	1,180	598	1,225	891	1,741
Del	54	31	29	110	-------
Idaho	1,656	1,730	1,122	1,612	1,442
Ill	24,864	24,393	28,182	27,594	20,970
Ind	11,624	11,480	13,637	9,671	8,368
Iowa	26,324	30,819	30,295	36,614	26,995
Kans	21,070	20,448	18,887	16,926	19,746
Ky	5,234	3,050	2,329	2,672	2,237
Md	346	238	283	241	179
Mass	336	347	390	113	114
Mich	2,561	1,962	1,435	2,374	1,649
Minn	13,937	12,914	21,322	24,080	24,450
Mo	19,817	19,305	16,301	13,974	10,399
Mont	471	315	399	450	545
Nebr	9,057	8,120	8,861	9,512	10,031
N. J	649	211	178	297	256
N. Y	14,167	12,489	14,415	23,858	19,582
N. Dak	1,236	1,841	2,099	2,783	4,194
Ohio	2,306	3,399	2,519	3,154	2,184
Okla	5,478	7,042	6,410	8,503	8,972
Oreg	649	766	338	747	1,005
Pa	660	524	537	801	946
S. Dak	3,595	4,692	5,007	6,625	5,667
Tenn	4,542	3,384	2,390	3,890	3,625
Tex	16,181	18,386	15,301	15,612	14,059
Utah	-------	305	559	472	575
Va	2,158	2,013	1,586	722	660
Wash	190	619	383	353	493
Wis	1,551	934	1,304	1,103	833
Wyo	499	372	449	510	489
Other States	780	1,115	705	600	583
Canada	47	20	-------	42	46
Total	194,376	197,057	200,885	218,911	195,445
CHICAGO	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Ark	688	193	216	381	38
Calif	28	234	78	138	18
Colo	293	378	546	433	631
Idaho	171	551	446	84	34
Ill	2,581	3,411	3,521	3,376	2,734
Ind	559	778	801	217	235
Iowa	13,117	18,505	18,152	13,694	11,689
Kans	4,315	5,108	4,111	4,580	2,847
Ky	32	124	143	477	153
Mich	379	62	111	79	84
Minn	7,829	13,833	9,891	10,852	9,512
Mo	6,379	6,647	5,985	4,603	4,293
Mont	1,530	2,904	1,898	1,135	1,339
Nebr	4,295	4,169	3,875	4,273	2,789
N. J	304	271	-------	194	74
N. Mex	96	145	226	164	250
N. Y	661	837	455	266	70
N. Dak	5,933	8,502	7,616	6,826	10,850
Ohio	26	273	185	59	31
Okla	2,712	2,830	1,880	2,607	1,616
S. Dak	7,371	10,366	9,010	9,282	8,312
Tenn	361	483	381	393	155
Tex	3,302	6,930	6,268	4,459	4,967
Wis	3,409	4,811	3,135	2,310	1,789
Wyo	260	373	444	264	313
Other States	494	650	779	329	526
Canada	55	-------	-------	-------	-------
Total	67,180	93,368	80,153	71,475	65,349
PHILADELPHIA					
Colo	107	350	16	283	495
Idaho	688	432	592	200	237
Ill	1,940	1,531	2,897	3,627	3,071
Ind	3,263	2,917	1,562	1,401	879
Iowa	4,962	5,558	6,577	6,333	6,544
Kans	4,901	3,564	2,248	2,496	2,242
Ky	542	621	756	218	791
Md	106	128	82	84	40
Mich	47	45	117	266	47
Minn	3,062	4,190	7,595	8,707	6,995
Mo	1,249	951	1,222	1,570	2,401
Nebr	1,089	1,438	1,288	2,416	2,321
N. J	305	130	812	197	-------
N. Y	683	749	442	310	46
N. Dak	620	1,140	882	793	1,273
Ohio	491	397	390	92	83
Okla	2,710	2,984	2,418	2,508	2,092
Pa	245	190	69	14	63
S. Dak	150	497	922	574	679
Tex	1,745	3,450	3,029	4,815	4,955
Va	1,097	1,166	853	421	462
W. Va	291	313	302	143	116
Wis	570	374	191	125	64
Other States	981	1,549	1,274	600	551
Total	31,844	34,664	36,536	38,193	36,447

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weight includes container and wrapping.

TABLE 420.—*Poultry: Receipts at New York, Chicago, Philadelphia, and Boston*

DRESSED POULTRY [1]

	New York	Chicago	Philadelphia	Boston		New York	Chicago	Philadelphia	Boston
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*		*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1920	101,093	67,324	21,606	34,086	1927	188,117	63,735	31,622	53,306
1921	124,551	64,992	22,892	39,921	1928	194,376	67,180	31,844	55,583
1922	138,212	73,661	21,319	44,563	1929	197,057	93,368	34,664	54,433
1923	163,948	90,273	24,611	56,013	1930	200,885	80,153	36,536	61,289
1924	179,362	88,464	27,640	61,264	1931	218,911	71,475	38,193	57,782
1925	170,257	72,080	29,295	46,720	1932	195,445	65,349	38,447	58,213
1926	192,895	77,632	32,126	53,162					

LIVE POULTRY

	New York [2]			Chicago		
	Freight	Express	Truck	Freight	Express	Truck
	Cars	*Cars* [3]	*Cars* [3]	*Cars*	*Cars* [3]	*Cars* [3]
1920	8,454					
1921	10,730					
1922	[4] 11,672					
1923	12,072	443				
1924	11,677	586				
1925	10,498	747				
1926	11,497	668				
1927	12,104	830				
1928	11,267	833				
1929	10,493	599		1,314	2,293	2,103
1930	10,677	423	1,386	1,141	2,113	2,122
1931	10,152	253	1,498	837	1,277	2,902
1932	9,126	142	2,048	318	570	3,461

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Gross weights, which include container and wrapping.
[2] From 1919–1926, inclusive, compiled from reports of Urner-Barry Co.
[3] Car-lot equivalents calculated from express and truck receipts.
[4] Includes express.

TABLE 421.—*Frozen poultry: Cold-storage holdings,[1] by months, United States, 1923–1932*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923	100,170	121,632	113,503	94,872	74,562	57,274	49,100	41,250	34,131	33,142	40,363	63,274
1924	93,434	99,486	93,497	76,067	52,068	39,299	34,886	33,604	33,837	40,070	55,139	87,939
1925	133,990	138,189	130,513	108,608	82,732	68,126	58,562	53,558	47,946	44,345	53,787	86,733
1926	111,501	108,512	95,397	73,124	52,783	42,808	36,730	35,793	38,634	44,771	64,842	106,854
1927	144,497	145,076	129,510	104,697	77,282	61,525	50,064	42,293	39,711	43,201	52,315	85,030
1928	117,490	118,154	103,494	83,169	56,832	43,872	38,230	40,395	40,749	43,578	58,093	79,173
1929	109,684	102,380	89,088	68,728	52,901	41,643	42,001	40,896	49,010	61,976	86,873	115,876
1930	140,723	141,552	133,172	105,708	77,420	61,167	54,253	46,967	42,589	46,938	59,269	82,925
1931	104,913	101,307	95,188	69,986	45,920	35,348	32,762	36,438	43,056	56,215	65,668	89,971
1932	116,700	111,554	96,422	74,660	56,676	44,829	36,661	31,471	30,305	36,683	54,969	91,118

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

[1] Quantities given net weight.

TABLE 422.—*Chickens, live: Estimated average price per pound received by producers United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	17.3	18.6	18.8	19.4	20.1	20.3	20.6	19.8	19.7	19.0	17.7	16.6	18.3
1924	17.5	18.2	18.9	19.4	20.3	20.5	20.2	20.0	19.8	19.4	18.5	17.9	18.8
1925	18.5	19.1	20.0	21.1	22.0	21.6	21.4	20.8	20.4	20.0	19.2	19.5	19.9
1926	20.9	21.5	21.9	23.1	23.7	23.9	23.6	22.1	21.4	20.8	20.0	19.8	21.2
1927	20.1	21.1	21.3	21.8	21.7	20.2	19.9	19.7	19.4	19.7	19.4	19.2	19.9
1928	19.6	20.1	20.1	20.8	21.5	21.5	21.9	21.6	22.3	22.0	21.5	21.2	21.2
1929	21.6	22.1	22.7	23.6	24.4	24.6	23.7	22.7	22.4	21.5	20.3	19.1	21.5
1930	19.8	20.4	20.6	21.1	20.0	19.0	17.4	17.3	17.8	17.4	16.1	15.3	17.6
1931	15.7	15.1	16.1	16.7	15.9	16.1	15.8	16.2	15.7	14.4	14.4	13.9	15.0
1932	13.3	12.6	12.6	12.6	12.2	11.4	11.7	11.7	11.6	10.7	10.1	9.2	11.0

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number 1919 census to obtain a price for the United States; yearly price obtained by weighting monthly prices by receipts of dressed poultry. Average price of chickens (live weight) of all ages as reported.

TABLE 423.—*Turkeys, live: Estimated average price per pound received by producers, United States, 1923–1932*

Season	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Season	Oct. 15	Nov. 15	Dec. 15	Jan. 15
	Cents	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*
1923	26.6	27.9	24.5	23.1	1928	27.2	31.2	30.5	28.2
1924	23.3	24.2	25.8	26.2	1929	27.2	27.1	23.5	23.7
1925	24.0	28.3	31.1	31.7	1930	21.0	20.1	19.9	21.6
1926	26.6	29.8	32.8	31.6	1931	17.9	18.3	19.4	18.0
1927	26.4	30.8	32.3	29.8	1932	13.2	12.9	10.9	10.2

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices, by States, weighted by number 1919 census to obtain a price for the United States.

TABLE 424.—*Eggs: Receipts at five markets, by months, 1929–1932*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Boston:													
1929	133	99	190	290	234	177	176	125	110	77	54	53	1,718
1930	96	112	209	227	208	175	138	102	82	66	68	90	1,573
1931	126	153	198	207	219	188	125	108	95	77	62	78	1,636
1932	98	138	181	164	201	155	117	109	79	71	64	62	1,439
New York:													
1929	394	371	821	1,061	999	837	668	526	444	380	293	335	7,129
1930	461	511	938	1,155	1,076	785	645	451	496	373	322	382	7,595
1931	478	530	940	1,116	1,052	868	568	516	484	398	304	347	7,601
1932	475	554	663	827	873	689	534	533	438	417	345	354	6,702
Philadelphia:													
1929	118	76	169	234	220	181	156	143	131	94	74	101	1,697
1930	100	112	204	244	261	178	145	94	114	91	86	130	1,759
1931	133	148	189	205	184	186	141	132	124	92	97	99	1,730
1932	114	105	136	193	171	153	114	110	125	101	90	84	1,496
Chicago:													
1929	206	222	554	924	799	554	342	301	210	135	62	89	4,398
1930	202	308	641	927	747	516	381	231	211	131	69	111	4,475
1931	231	367	634	867	709	559	290	238	191	96	61	71	4,314
1932	178	224	378	657	663	437	258	219	161	104	60	73	3,412
San Francisco:													
1929	87	63	82	86	80	65	67	55	49	49	49	54	766
1930	59	67	71	79	73	74	69	65	50	55	47	56	765
1931	58	66	85	83	72	61	56	59	49	59	54	56	758
1932	72	68	77	75	63	62	57	64	51	46	45	45	725

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. Reported in cases of 30 dozen. See 1927 and 1931 Yearbooks for data for earlier years.

TABLE 425.—*Eggs: Production and value in the United States, 1925–1932*

Year	Production	Price per egg	Total value
	Millions	*Cents*	*1,000 dollars*
1925 census	22,959	2.49	571,938
1925	29,222	----	----
1926	30,183	----	----
1927	31,671	----	----
1928	32,524	----	----
1929	32,275	2.46	793,827
1930 census	32,277	2.48	799,261
1930	33,530	2.05	688,227
1931	34,442	1.44	496,397
1932	32,306	1.13	363,557

Bureau of Agricultural Economics.

TABLE 426.—*Eggs: Receipts at six markets by State of origin, 1928–1932*

Market and origin	1928	1929	1930	1931	1932
BOSTON	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Illinois	251	195	161	191	138
Indiana	152	133	117	101	87
Iowa	194	245	272	323	282
Kansas	244	253	171	211	204
Maine	84	70	64	45	35
Massachusetts	7	6	10	9	6
Michigan	36	36	35	47	37
Minnesota	236	221	229	229	157
Missouri	106	107	64	80	82
Nebraska	94	128	139	117	107
New Hampshire	31	24	28	24	23
New York	32	31	27	25	15
Ohio	53	52	44	55	70
Vermont	22	17	17	15	15
Other States	215	200	195	164	181
Total	1,757	1,718	1,573	1,636	1,439
CHICAGO					
California	67	54	33	73	24
Illinois	120	184	150	127	219
Iowa	826	804	977	959	706
Kansas	446	315	232	295	319
Michigan	57	40	22	13	58
Minnesota	545	688	772	778	401
Missouri	674	566	542	555	678
Nebraska	438	429	399	340	159
North Dakota	38	45	40	51	----
Oklahoma	96	68	35	34	97
South Dakota	467	445	508	459	279
Texas	97	67	13	21	17
Wisconsin	427	477	490	382	254
Other States	303	216	262	227	190
Total	4,601	4,398	4,475	4,314	3,412
NEW YORK					
California	589	581	696	589	501
Delaware	72	39	39	28	35
Idaho	34	32	70	204	156
Illinois	869	771	829	704	631
Indiana	468	437	454	387	329
Iowa	1,071	1,254	1,388	1,354	1,070
Kansas	280	318	275	255	278
Kentucky	63	23	31	24	40
Maryland	131	88	70	36	41
Michigan	46	42	70	80	62
Minnesota	204	195	279	353	469
Missouri	349	403	276	328	286
Nebraska	132	145	166	273	216
New Jersey	180	214	228	232	201
New York	666	660	625	468	354
Ohio	276	204	209	228	294
NEW YORK—con.	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Oregon	72	48	53	94	126
Pennsylvania	191	189	214	166	179
Tennessee	186	113	87	36	33
Utah	217	215	396	554	378
Virginia	102	89	79	39	68
Washington	661	669	760	859	683
Wisconsin	54	29	49	57	34
Other States	375	371	250	255	248
Total	7,288	7,129	7,595	7,601	6,702
PHILADELPHIA					
California	82	65	112	97	72
Delaware	49	51	44	24	10
Illinois	124	113	124	187	118
Indiana	60	56	44	35	25
Iowa	128	126	126	164	139
Kansas	91	71	78	101	121
Maryland	38	43	55	33	19
Michigan	61	57	47	69	27
Minnesota	196	218	237	227	223
Missouri	163	167	157	207	255
Nebraska	29	34	39	37	37
New York	24	41	22	20	31
Ohio	54	51	47	27	23
Pennsylvania	273	274	287	177	119
Tennessee	22	15	25	9	20
Virginia	125	108	86	37	39
Washington	59	61	72	76	56
West Virginia	6	5	4	3	5
Wisconsin	38	52	65	67	45
Other States	93	89	89	143	112
Total	1,735	1,697	1,759	1,730	1,496
SAN FRANCISCO					
California	710	737	749	730	700
Idaho	13	3	2	2	2
Oregon	23	18	8	20	12
Washington	6	4	([1])	3	7
Other States	4	4	6	3	4
Total	756	766	765	758	725
LOS ANGELES					
California	604	641	761	730	539
Idaho	10	31	22	6	9
Oregon	7	18	5	14	13
Utah	4	20	52	3	15
Other States	8	25	4	14	16
Total	633	735	844	767	592

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets. Reported in cases of 30 dozen.

[1] Not over 500 cases.

TABLE 427.—*Eggs: Receipts at five markets, 1919–1932*

[Reported in cases of 30 dozen]

	New York	Chicago	Philadelphia	Boston	San Francisco		New York	Chicago	Philadelphia	Boston	San Francisco
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*		*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
1919	6,008	4,617	1,704	1,659	698	1926	6,818	4,575	1,566	1,808	744
1920	4,991	4,154	1,396	1,648	757	1927	7,048	4,901	1,549	1,960	750
1921	6,579	4,155	1,642	1,823	811	1928	7,288	4,601	1,735	1,757	756
1922	6,821	4,684	1,703	1,970	838	1929	7,129	4,398	1,697	1,718	766
1923	7,150	5,009	1,727	1,944	855	1930	7,595	4,475	1,759	1,573	765
1924	6,543	4,679	1,595	1,829	760	1931	7,601	4,314	1,730	1,636	758
1925	6,894	4,408	1,572	1,833	743	1932	6,702	3,412	1,406	1,439	725

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 428.—*Eggs, shell and frozen: Cold-storage holdings, United States, 1923–1932*

Kind and year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
Shell eggs: [1]	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
1923	1,311	213	13	453	3,737	7,890	10,222	10,509	9,883	8,737	6,645	4,028
1924	1,927	500	44	579	3,563	6,875	8,685	9,267	8,778	7,409	5,267	3,102
1925	1,050	81	21	1,240	4,872	7,712	9,482	10,024	9,873	8,612	6,322	3,786
1926	1,683	578	77	872	3,735	7,236	9,133	9,845	9,573	8,048	5,888	3,215
1927	1,096	253	92	1,868	5,501	8,962	10,565	10,746	9,650	7,960	5,485	2,956
1928	882	26	66	1,087	4,515	8,168	10,002	10,496	9,944	8,542	6,247	3,542
1929	1,415	248	11	559	3,952	6,705	8,510	8,962	8,547	7,195	4,930	2,631
1930	704	139	84	2,231	5,766	9,178	10,743	11,198	10,375	9,174	6,785	4,154
1931	1,894	735	408	1,893	5,162	7,887	9,507	9,504	9,016	7,960	5,745	3,447
1932	1,475	663	258	700	2,982	5,380	6,339	6,431	5,960	4,895	3,225	1,199
Frozen eggs: [2]	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1923	22,787	18,517	14,603	10,311	12,921	20,730	29,686	36,192	37,280	43,836	40,424	36,004
1924	32,087	27,682	23,106	20,736	23,707	29,956	33,565	35,184	34,128	31,006	26,633	22,100
1925	21,303	16,292	11,364	11,353	19,579	29,544	38,379	42,855	47,099	44,299	45,314	39,336
1926	33,905	29,256	24,167	21,849	25,739	34,815	45,688	51,810	52,634	51,062	44,966	38,620
1927	33,593	31,207	26,053	33,272	52,053	71,605	81,263	81,418	77,508	71,208	62,066	54,703
1928	47,020	38,575	31,362	34,411	51,532	67,941	77,744	81,670	89,196	82,255	73,327	64,201
1929	56,181	48,055	38,250	34,918	51,825	71,560	84,766	91,488	86,693	81,541	70,331	61,772
1930	53,644	44,080	35,192	49,751	76,664	106,904	115,134	116,272	113,138	106,631	98,359	89,571
1931	83,184	75,685	73,889	78,051	91,517	106,607	113,513	114,700	110,271	103,302	94,816	86,407
1932	79,198	72,439	68,024	69,031	81,920	94,978	100,485	99,112	92,967	84,187	74,314	64,150

Bureau of Agricultural Economics. Compiled from reports made by cold-storage establishments.

[1] 30-dozen cases.

[2] Quantities given are net weight. 35 pounds of frozen eggs are approximately equivalent to 1 case of 30 dozen shell eggs.

TABLE 429.—*Eggs: Estimated average price per dozen received by producers, United States, 1923–1932*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	37.8	29.9	25.4	21.6	21.8	20.9	21.3	23.6	29.8	34.6	45.6	45.5	25.6
1924	35.4	33.6	20.4	19.1	19.8	21.1	22.8	26.1	31.8	38.2	45.8	49.9	25.2
1925	48.6	35.7	23.9	24.2	24.8	26.1	27.9	30.0	31.1	37.7	46.8	48.1	29.1
1926	36.3	28.9	24.1	24.8	25.2	25.7	25.7	26.4	31.5	36.8	44.9	47.6	27.9
1927	36.9	29.0	20.8	20.3	19.8	17.8	20.7	23.4	29.4	35.6	41.6	43.3	23.8
1928	38.2	29.1	23.4	22.8	24.2	23.9	25.6	27.4	31.4	34.9	39.6	42.9	26.8
1929	33.0	31.9	28.0	23.0	24.4	26.1	27.2	29.8	33.9	38.4	44.2	45.8	28.6
1930	38.4	31.8	21.3	21.5	20.0	18.6	18.8	20.6	25.3	26.5	31.7	26.8	22.7
1931	22.1	14.1	17.0	16.2	13.3	14.1	14.8	17.3	19.1	22.7	26.4	25.6	16.6
1932	17.2	12.8	10.4	10.2	10.3	10.6	12.0	14.7	17.2	22.5	26.1	28.1	13.1

Bureau of Agricultural Economics. Based on returns from special price reporters. Monthly prices by States, weighted by production 1919 census to obtain a price for the United States. Yearly price obtained by weighting monthly prices by receipts monthly.

TABLE 430.—*Eggs and egg products: International trade, average 1925–1929, annual 1928–1931*

EGGS IN THE SHELL

Country	Calendar year: Average 1925–1929, Exports	Average 1925–1929, Imports	1928, Exports	1928, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931 [1], Exports	1931 [1], Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*
Netherlands	98,429	8,965	111,145	11,376	119,909	4,879	124,859	1,324	126,689	425
Russia	86,978	0	141,429	0	65,219	0	14,471	163	30,038	100
Poland	76,215	493	80,190	601	78,620	298	80,999	50	70,687	2
Denmark	67,641	225	65,750	133	65,474	25	71,853	52	81,193	0
China	56,278	0	52,059	0	50,489	0	51,360	0	50,944	0
Irish Free State	47,058	449	50,465	547	48,100	275	47,355	106	46,097	103
Belgium	41,430	1,419	56,819	917	59,661	1,512	42,926	1,703	47,778	714
Italy	25,943	17,969	17,675	28,299	15,542	24,071	13,701	33,543	13,205	36,213
France	24,536	11,499	46,564	11,723	29,691	16,863	23,512	16,422	10,069	45,095
United States	22,621	350	20,192	286	12,075	308	18,579	317	7,684	309
Hungary	18,028	338	12,999	410	10,589	431	19,367	205	17,609	72
Bulgaria	17,258	0	15,650	0	18,697	0	28,239	0	32,875	0
Rumania	15,011	1	[2] 13,328	[2] 0	[2] 16,960	[2] 1	24,725	1	------	------
Morocco	14,985	0	13,207	0	18,469	0	14,629	0	13,828	0
Egypt	10,879	6	10,625	14	12,461	1	8,202	0	10,445	0
Algeria	5,830	17	5,762	30	6,839	49	4,233	[2] 15	1,898	------
Lithuania	5,313	0	5,388	0	4,626	0	4,599	0	5,083	0
Sweden	4,422	679	5,432	334	7,419	351	6,543	628	256	119
Union of South Africa	3,477	113	3,929	146	4,546	48	6,158	47	6,143	90
Estonia	1,428	4	1,960	20	1,859	0	2,065	1	2,197	0
Norway	670	111	178	102	995	119	1,056	114	1,153	134
Finland	58	37	9	74	59	14	630	12	2,754	------
Total	644,286	42,675	730,755	53,032	648,538	49,245	610,067	54,703	578,624	83,376
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	973	238,350	1,131	263,740	1,556	247,430	715	264,306	227	258,729
Germany	591	220,035	685	245,746	253	229,412	159	219,909	204	193,915
Spain	15	34,479	12	48,585	13	44,341	12	39,154	15	33,370
Austria	1,730	22,033	1,727	25,692	1,773	20,884	1,939	25,869	1,452	25,618
Japan	0	20,465	0	16,269	0	10,074	0	8,167	0	12,142
Switzerland	13	17,132	17	16,964	16	18,004	9	20,221	24	23,003
Argentina	1,518	9,791	1,073	11,792	482	11,388	969	14,846	2,606	8,318
Cuba	0	8,793	0	6,392	0	2,642	0	1,314	0	------
Philippine Islands	0	5,935	0	6,016	0	7,237	0	6,958	0	10,990
Czechoslovakia	1,828	4,917	1,999	7,205	1,921	7,114	2,622	7,936	1,223	12,136
Mexico	0	4,202	0	3,903	0	2,295	0	4,361	0	89
British Malaya	366	3,638	340	3,618	426	4,606	270	4,341	218	3,366
Canada	1,365	2,244	988	997	1,148	713	189	2,908	634	68
Chile	[3] 22	67	0	139	1	184	19	337	0	164
Total	8,421	592,081	7,972	657,058	7,589	606,294	6,903	620,627	6,603	581,908

EGGS NOT IN THE SHELL

Country	Average 1925–1929, Exports	Average 1925–1929, Imports	1928, Exports	1928, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931 [1], Exports	1931 [1], Imports
PRINCIPAL EXPORTING COUNTRY	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
China	128,990	0	126,803	0	150,923	0	153,304	0	132,606	0
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	598	65,731	614	65,221	384	74,542	157	85,630	111	83,280
United States	484	24,914	608	23,474	328	26,030	196	16,156	255	7,661
Germany	2,098	18,252	2,385	19,362	2,418	25,544	2,065	27,231	1,908	21,031
France	238	7,375	99	9,026	496	10,061	255	13,060	224	19,702
Netherlands	860	4,355	1,064	4,133	791	5,465	1,009	5,588	865	4,962
Canada	0	1,700	0	3,030	0	560	0	1,758	0	120
Italy	16	1,317	28	1,378	6	1,647	12	1,854	9	2,690
Belgium	216	1,137	194	1,169	592	1,631	486	1,642	1,665	2,730
Irish Free State	19	1,031	13	883	4	1,067	19	1,126	0	1,202
Sweden	5	859	1	828	2	1,232	19	1,073	0	1,126
Czechoslovakia	13	850	9	901	7	1,233	7	1,579	2	1,955
Austria	6	680	26	715	6	1,633	0	1,290	0	1,022
Denmark	7	512	11	293	1	458	7	570	15	636
Union of South Africa	16	54	0	24	0	14	31	7	3	10
Norway	0	11	0	10	0	19	0	22	0	------
Total	4,568	128,778	4,952	130,445	5,028	151,156	4,263	156,606	5,087	148,183

Bureau of Agricultural Economics. Official sources except where otherwise noted. In countries reporting other than dozens of eggs, the conversion factor used is 1½ pounds equals 1 dozen.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] 4-year average.

TABLE 431.—*Eggs: Average price per dozen at five markets, by months, specified years*

Market, grade, and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
New York:													
Fresh firsts—	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	42	37	31	27	27	24	25	29	35	39	53	47	35
1924	42	39	25	24	25	27	29	33	39	44	52	57	36
1925	50	44	30	29	32	33	33	33	37	43	56	51	40
1926	38	31	29	32	31	30	29	31	38	40	50	48	36
1927	42	32	25	26	23	23	25	28	34	40	44	45	32
1928	45	32	29	28	30	29	30	31	33	32	37	37	33
1929	36	41	33	28	31	31	32	34	36	40	48	51	37
1930	42	35	26	27	23	24	22	25	25	26	31	29	28
1931	24	20	22	20	19	19	20	22	24	24	28	27	22
1932	19	18	15	15	16	16	16	20	22	26	34	33	21
Chicago:													
Fresh firsts—													
1928	43	29	27	27	28	28	28	30	32	34	41	39	32
1929	36	38	29	26	30	29	31	33	37	42	47	48	35
1930	40	34	24	24	21	22	21	25	26	28	33	28	27
1931	21	16	19	17	17	16	18	19	20	24	29	24	20
1932	18	14	12	12	12	12	13	16	19	23	30	29	18
Boston:													
Western firsts—													
1928	46	35	29	29	30	30	30	32	34	36	44	43	35
1929	38	43	32	28	31	31	32	35	37	40	49	52	37
1930	44	37	26	26	24	24	22	25	25	26	34	28	39
1931	25	18	21	20	18	17	19	20	21	25	30	27	22
1932	19	17	14	14	15	14	15	18	21	24	30	32	20
Philadelphia:													
Extra firsts—													
1928	50	37	30	30	32	32	33	36	39	42	50	45	38
1929	41	45	35	29	33	34	36	39	44	49	56	58	41
1930	46	40	28	28	26	27	28	32	33	36	44	32	33
1931	28	20	22	21	19	21	24	24	26	29	34	31	25
1932	23	18	15	15	16	16	17	22	23	28	35	34	22
San Francisco:													
Fresh extras—													
1928	33	24	25	25	26	29	30	33	39	44	45	38	33
1929	31	26	25	26	31	32	37	41	44	52	49	44	36
1930	36	28	28	28	27	26	26	31	37	40	41	27	31
1931	22	19	20	20	20	20	22	26	31	38	33	29	25
1932	20	17	17	16	16	17	18	20	27	30	33	28	22

Bureau of Agricultural Economics. Compiled from the Bureau of Labor Statistics wholesale price bulletins, monthly, except prices for San Francisco, which are from the Pacific Dairy Review. Earlier data are available in 1925 Yearbook, p. 1224, and 1927 Yearbook, p. 1105.

STATISTICS OF FOREIGN TRADE IN AGRICULTURAL PRODUCTS

TABLE 432.—*Summary of exports and imports, United States, 1908–9 to 1931–32*

Year beginning July	Total exports	Agricultural exports[1]			Total imports	Agricultural imports[1]		Excess of agricultural exports	Forest products			
		Domestic		Reexports		Value	Per centage of total		Exports		Imports	Excess of imports
		Value	Percentage of total						Domestic	Reexports		
	1,000 dollars	*1,000 dollars*	*Per cent*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Per cent*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
1908–9	1,638,356	903,238	55.1	12,779	1,311,920	703,323	53.6	212,694	72,442	1,789	60,753	[2] 13,478
1909–10	1,710,084	871,158	50.9	22,162	1,556,947	794,370	51.0	98,950	85,030	2,110	75,010	[2] 12,130
1910–11	*2,013,549*	*1,030,794*	*51.2*	*20,573*	*1,527,226*	*773,116*	*50.6*	278,251	103,039	*1,679*	*71,736*	[2] 32,982
1911–12	2,170,320	1,050,627	48.4	17,171	1,653,265	888,495	53.7	179,303	108,122	1,350	69,581	[2] 39,891
1912–13	2,428,506	1,123,652	46.3	19,652	1,813,008	916,634	50.6	226,670	124,836	2,609	82,878	[2] 44,767
1913–14	2,329,684	1,113,974	47.8	20,286	1,893,926	1,000,409	52.8	133,851	106,979	1,961	81,162	[2] 27,778
1914–15	2,716,178	1,475,938	54.3	38,222	1,674,170	997,911	59.6	516,249	52,554	1,287	79,451	25,610
1915–16	*4,272,178*	*1,518,071*	*35.5*	*45,017*	*2,197,884*	*1,349,563*	*61.4*	*213,525*	*68,155*	*1,435*	*94,265*	*24,675*
1916–17	6,227,164	1,968,253	31.6	45,420	2,659,355	1,599,660	60.2	414,013	68,919	3,302	129,580	57,269
1917–18	5,838,652	2,280,466	39.1	44,210	2,945,655	1,826,436	62.0	498,240	87,181	1,409	128,490	39,900
1918–19	7,081,462	3,579,918	50.6	105,587	3,095,720	1,930,028	62.3	1,755,477	113,275	3,758	132,588	15,555
1919–20	7,949,309	3,861,511	48.6	128,191	5,238,352	3,410,018	65.1	579,684	190,049	5,380	220,091	33,662
1920–21	*6,385,884*	*2,607,641*	*40.8*	*90,739*	*3,654,459*	*2,060,237*	*56.4*	*638,143*	*141,876*	*4,043*	*225,162*	*79,243*
1921–22	3,699,909	1,915,866	51.8	43,589	2,608,079	1,371,720	52.6	587,735	94,115	2,315	156,843	70,413
1922–23	3,886,682	1,799,168	46.3	48,393	3,780,959	2,077,240	54.9	[3] 229,679	129,961	1,955	234,596	102,662
1923–24	*4,223,973*	*1,867,098*	*44.2*	*62,719*	*3,554,037*	*1,875,365*	*52.8*	*54,452*	*162,374*	*1,563*	*216,712*	*52,775*
1924–25	4,778,155	2,280,381	47.7	64,168	3,824,128	2,057,163	53.8	287,386	156,187	1,290	227,423	69,946
1925–26	4,653,148	1,891,739	*40.7*	*75,162*	4,464,872	*2,529,775*	*56.7*	[3] *562,874*	*162,731*	1,450	238,545	74,364
1926–27	4,867,346	1,907,864	39.2	72,222	4,252,024	2,281,421	53.7	[3] 301,335	171,970	1,365	238,247	64,912
1927–28	4,773,332	1,815,451	38.0	73,391	4,147,499	2,193,868	52.9	[3] 305,026	174,599	1,628	215,874	39,747
1928–29	5,283,938	1,847,216	35.0	63,942	4,291,888	2,179,046	50.8	[3] 267,888	178,092	2,157	222,249	42,000
1929–30	4,617,730	1,495,907	32.4	50,670	3,848,971	1,890,508	49.1	[3] 343,931	161,743	1,382	209,418	46,293
1930–31	*3,031,557*	*1,038,034*	*34.2*	*28,791*	*2,432,074*	*1,163,054*	*47.8*	[3] 96,229	97,695	858	142,590	44,037
1931–32[4]	1,909,123	752,141	39.4	22,692	1,731,380	835,400	48.3	[3] 60,567	62,270	409	104,435	41,756

Bureau of Agricultural Economics. This table supersedes Table 500 in the Yearbook of Agriculture, 1931, the value of total imports and exports has been given and the imports of rubber, unmanufactured, and similar gums have been deducted from the imports of forest products and added to imports of agricultural products, also reexports of rubber, unmanufactured, and *similar gums have been deducted from* reexports of forest products and added to reexports of agricultural products. Rubber, unmanufactured, and similar gums, includes: Balata, guayule, gutta-joolatong or jelutong or pontianak, gutta-percha, India rubber, crude, and India rubber scrap or refuse, fit only for remanufacture. In the statistics of foreign commerce of the United States the Philippine Islands are treated as a foreign country. The statistics of foreign commerce includes the trade of the customs districts of Alaska, Hawaii, and Puerto Rico with foreign countries, but do not include the trade of these Territories with the United States.

[1] Does not include forest products, but includes rubber now mostly a plantation product.
[2] Excess of exports. [3] Excess of agricultural imports. [4] Preliminary.

TABLE 433.—*Agricultural products: Value of trade between continental United States and noncontiguous Territories, 1922–23 to 1931–32*

Year beginning July	Puerto Rico		Hawaii		Alaska	
	United States shipments to	Shipments to United States	United States shipments to	Shipments to United States	United States shipments to	Shipments to United States
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
1922–23	24,080	61,801	15,096	93,313	8,297	190
1923–24	28,819	66,581	17,539	104,267	9,016	365
1924–25	29,710	70,190	17,954	97,430	9,774	415
1925–26	32,212	70,385	17,806	105,470	9,539	516
1926–27	32,603	84,061	18,019	98,600	8,737	720
1927–28	28,146	82,326	19,004	110,338	9,435	231
1928–29	31,466	53,333	19,348	103,653	9,108	290
1929–30	28,117	75,868	19,883	98,097	9,257	511
1930–31	25,062	75,390	17,759	103,119	6,982	380
1931–32[1]	18,792	67,763	15,774	92,430	5,443	147

Bureau of Agricultural Economics. *Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1923–1932.*

[1] Preliminary.

TABLE 434.—*Agricultural products: Value of principal groups exported from and imported into the United States, 1929–30 to 1931–32*

Article	Year beginning July					
	Domestic exports			General imports		
	1929–30	1930–31	1931–32 [1]	1929–30	1930–31	1931–32 [1]
ANIMALS AND ANIMAL PRODUCTS	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Animals, live	5, 307	2, 954	1, 000	21, 148	5, 312	4, 275
Dairy products	16, 575	12, 248	8, 721	31, 907	16, 942	14, 293
Eggs and egg products	4, 470	3, 472	827	8, 851	2, 890	1, 158
Hides and skins, raw (except fur)	5, 896	4, 208	2, 230	129, 890	60, 734	37, 412
Meat and meat products	181, 585	117, 195	66, 811	23, 754	6, 890	5, 775
Silk, unmanufactured				360, 682	227, 323	158, 479
Wool and mohair, unmanufactured	103	55	34	59, 414	24, 390	12, 706
Animal products, miscellaneous	11, 184	7, 465	5, 837	40, 686	27, 645	16, 373
Total	225, 120	147, 597	85, 550	676, 332	372, 126	250, 471
VEGETABLE PRODUCTS						
Chocolate and cocoa	616	448	322	40, 755	28, 029	20, 412
Coffee	2, 746	2, 790	1, 607	256, 541	192, 820	149, 110
Cotton lint, unmanufactured	667, 243	422, 105	337, 595	42, 078	5, 328	6, 435
Linters	3, 959	2, 453	1, 692			
Total cotton, unmanufactured	671, 202	424, 558	339, 287	42, 078	5, 328	6, 435
Fruits	110, 431	120, 586	91, 684	60, 889	47, 308	37, 825
Grains and grain products	248, 268	146, 580	106, 405	24, 280	26, 264	12, 219
Nuts	1, 398	1, 169	1, 028	24, 765	17, 737	13, 491
Oilseeds and oilseed products	32, 875	15, 601	17, 779	167, 286	101, 090	66, 924
Rubber and similar gums				195, 680	96, 112	51, 925
Seeds, except oilseeds	3, 755	3, 198	1, 839	7, 819	5, 317	3, 772
Spices	344	178	133	18, 435	11, 160	8, 903
Sugar, molasses, and sirups	6, 489	4, 066	2, 328	176, 565	126, 526	115, 576
Tea				24, 321	21, 903	15, 767
Tobacco, unmanufactured	148, 452	142, 285	86, 281	47, 556	37, 692	32, 544
Vegetables and preparations	23, 638	15, 403	8, 725	49, 823	28, 297	18, 848
Vegetable products, miscellaneous	20, 573	13, 575	9, 173	77, 383	45, 345	31, 178
Total vegetable products	1, 270, 787	890, 437	666, 591	1, 214, 176	790, 928	584, 929
Total animal and vegetable products	1, 495, 907	1, 038, 034	752, 141	1, 890, 508	1, 163, 054	835, 400
FOREST PRODUCTS						
Dyeing and tanning materials	2, 258	1, 620	1, 536	8, 065	5, 524	4, 685
Gums, resins, and balsams	28, 511	17, 631	13, 415	29, 134	15, 504	10, 770
Wood	122, 648	72, 773	42, 247	79, 049	51, 729	31, 592
Forest products, miscellaneous	8, 326	5, 671	5, 072	93, 170	69, 833	57, 388
Total	161, 743	97, 695	62, 270	209, 418	142, 590	104, 435
Total agricultural products	1, 657, 650	1, 135, 729	814, 411	2, 099, 926	1, 305, 644	939, 835

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1931 and 1932. In the statistics of foreign commerce of the United States, the Philippine Islands are treated as a foreign country. The statistics of foreign commerce include the trade of the customs districts of Alaska, Hawaii, and Puerto Rico with foreign countries, but do not include the trade of these Territories with the United States.

[1] Preliminary.

TABLE 435.—*Index numbers of quantities of principal agricultural exports, United States 1909–10 to 1931–32*

[Base 1910–1914=100]

Year beginning July—	Total 44 commodities	Total 44 commodities except cotton	Cotton fiber	Grains and products	Cattle and meat products	Dairy products	Fruits	Tobacco
	Index no.	*Index no.*	*Index no.*	*Index no.*	*Index no.*	*Index no.*	*Index no.*	*Index no.*
1909–10	78	86	73	82	91	58	76	91
1910–11	92	92	91	85	104	93	89	90
1911–12	114	100	125	78	115	120	101	97
1912–13	110	119	103	143	97	120	138	107
1913–14	106	103	108	112	92	103	98	114
1914–15	138	189	99	301	128	302	119	80
1915–16	118	184	70	237	164	479	109	113
1916–17	118	182	70	217	164	716	101	108
1917–18	101	165	53	179	197	975	63	74
1918–19	145	258	63	272	287	1,287	111	160
1919–20	134	207	80	218	185	1,275	122	105
1920–21	127	212	64	329	154	524	108	129
1921–22	137	218	76	317	153	571	105	118
1922–23	112	182	59	248	169	406	121	116
1923–24	104	153	67	143	179	451	214	152
1924–25	126	167	95	225	140	396	184	110
1925–26	106	123	93	117	114	327	211	137
1926–27	136	143	131	188	98	288	301	132
1927–28	112	138	92	188	98	283	258	125
1928–29	117	141	99	174	102	243	372	144
1929–30	97	117	82	130	104	221	216	153
1930–31	90	101	81	104	74	190	337	150
1931–32	98	91	103	104	63	123	305	110

Bureau of Agricultural Economics. Computations are based on the gross exports of 44 of the most important farm products. The index numbers were calculated as follows: Quantities of various commodities exported each year were multiplied by the average yearly export prices of these commodities from July, 1909, to June, 1914. The sum of the values determined in this way was then divided by the average yearly value of exports from 1909–10 to 1913–14 to obtain the index.

TABLE 436.—*Exports and imports of selected forest products, 1909–10 to 1931–32*

Year beginning July—	Domestic exports					Imports				
	Lumber						Lumber			
	Boards, deals, and planks	Staves	Rosin	Spirits of turpentine	Timber, hewn and sawed	Camphor, crude	Boards, deals, planks and other sawed	Shingles	Shellac	Wood pulp
	1,000 M feet	*Thousands*	*1,000 barrels*	*1,000 gallons*	*1,000 M feet*	*1,000 pounds*	*1,000 M feet*	*1,000 M*	*1,000 pounds*	*1,000 long tons*
1909–10	1,684	49,784	2,144	15,588	491	3,007	1,054	763	29,402	378
1910–11	2,032	65,726	2,190	14,818	532	3,726	872	643	15,495	492
1911–12	2,307	64,168	2,474	19,599	438	2,165	905	515	18,746	478
1912–13	2,550	89,006	2,806	21,094	512	3,709	1,091	560	21,912	502
1913–14	2,405	77,151	2,418	18,901	441	3,477	929	895	16,720	508
1914–15	1,129	39,297	1,372	9,464	174	3,729	939	1,487	24,153	588
1915–16	1,177	57,538	1,571	9,310	201	4,574	1,218	1,769	25,818	507
1916–17	1,042	61,469	1,639	8,842	184	6,885	1,175	1,924	32,540	699
1917–18	1,068	63,207	1,071	5,095	106	3,638	1,283	1,878	22,913	504
1918–19	1,073	62,753	882	8,065	92	2,623	977	1,757	14,269	475
1919–20	1,518	80,791	1,322	7,461	234	4,026	1,492	2,152	34,151	727
1920–21	1,269	65,710	877	9,742	123	2,093	920	1,831	23,872	624
1921–22	1,543	35,162	786	10,786	268	1,592	1,124	2,190	30,768	902
1922–23	1,549	57,466	1,040	9,012	383	3,498	1,958	2,695	32,773	1,293
1923–24	1,867	60,868	1,205	11,194	815	1,955	1,786	2,417	28,512	1,188
1924–25	1,929	79,922	1,412	12,308	586	1,904	1,732	2,551	21,436	1,529
1925–26	1,985	75,534	1,073	10,254	652	2,616	1,869	2,482	26,188	1,469
1926–27	2,013	74,826	1,229	13,820	707	2,175	1,841	2,275	28,707	1,509
1927–28	2,318	78,466	1,300	14,332	825	2,704	1,529	2,034	23,012	1,521
1928–29	2,387	82,409	1,309	14,175	711	5,064	1,441	2,052	31,548	1,643
1929–30	2,100	78,624	1,366	15,722	657	1,777	1,461	1,387	26,444	1,722
1930–31	1,466	47,207	1,099	13,282	406	1,246	915	1,058	14,145	1,456
1931–32 [1]	1,012	34,982	1,156	13,520	319	2,387	627	1,081	13,006	1,459

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1909–1918, and Monthly Summary of Foreign Commerce of the United States, June issues, 1921–1932.

[1] Preliminary.

TABLE 437.—*Exports of selected domestic agricultural products, annual 1909–10 to 1931–32*

Year beginning July—	Butter	Cheese	Milk, condensed and evaporated	Eggs in the shell	Pork and its products, total [1]	Pork, fresh	Pork, pickled	Bacon, including Cumberland sides	Hams and shoulders, including Wiltshire sides	Lard
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 dozen*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1909–10	3, 141	2, 847	13, 311	5, 326	707, 110	1, 040	40, 032	152, 163	146, 885	362, 928
1910–11	4, 878	10, 367	12, 180	8, 559	879, 455	1, 355	45, 729	156, 675	57, 709	476, 108
1911–12	6, 092	6, 338	20, 643	15, 406	1, 071, 952	2, 598	56, 321	208, 574	204, 044	532, 256
1912–13	3, 586	2, 599	16, 526	20, 409	984, 697	2, 458	53, 749	200, 994	159, 545	519, 025
1913–14	3, 694	2, 428	16, 209	16, 149	921, 913	2, 668	45, 543	193, 964	165, 882	481, 458
1914–15	9, 851	55, 363	37, 236	20, 784	1, 106, 180	3, 908	45, 656	346, 718	203, 701	475, 532
1915–16	13, 487	44, 394	159, 578	26, 396	1, 462, 697	63, 006	63, 461	579, 809	282, 209	427, 011
1916–17	26, 835	66, 050	259, 141	24, 926	1, 501, 948	50, 436	46, 993	667, 152	266, 657	444, 770
1917–18	17, 736	44, 303	528, 759	18, 969	1, 692, 124	21, 390	33, 222	815, 294	419, 572	392, 506
1918–19	33, 740	18, 792	728, 741	28, 385	2, 704, 694	19, 644	31, 504	1, 238, 247	667, 240	724, 771
1919–20	27, 156	19, 378	708, 463	38, 327	1, 762, 611	27, 225	41, 643	803, 667	275, 456	587, 225
1920–21	7, 829	10, 826	262, 668	26, 960	1, 522, 162	57, 075	33, 286	489, 298	172, 012	746, 157
1921–22	7, 512	7, 471	277, 311	33, 702	1, 516, 320	25, 911	33, 510	350, 540	271, 642	812, 379
1922–23	9, 410	8, 446	157, 038	34, 284	1, 794, 880	43, 772	40, 934	408, 334	319, 269	952, 642
1923–24	5, 425	3, 938	213, 613	32, 832	1, 934, 189	49, 113	37, 469	423, 500	381, 564	1, 014, 898
1924–25	8, 384	9, 432	173, 547	25, 107	1, 400, 149	27, 603	26, 728	236, 263	292, 214	792, 735
1925–26	5, 280	4, 094	135, 865	27, 931	1, 172, 685	15, 867	29, 126	186, 153	220, 014	695, 445
1926–27	5, 048	3, 773	108, 942	27, 962	1, 012, 668	10, 881	27, 962	127, 576	143, 649	675, 812
1927–28	3, 965	2, 873	108, 943	22, 832	1, 046, 306	11, 059	31, 650	126, 977	127, 819	716, 398
1928–29	3, 778	2, 572	112, 492	15, 982	1, 112, 394	10, 641	39, 906	120, 248	125, 396	780, 914
1929–30	3, 582	2, 339	101, 572	14, 234	1, 138, 588	18, 768	39, 809	132, 967	130, 318	787, 160
1930–31	2, 293	1, 733	78, 986	14, 386	791, 354	11, 093	21, 118	52, 412	99, 749	585, 670
1931–32 [2]	1, 578	1, 607	65, 580	3, 519	679, 748	9, 272	15, 229	[3] 25, 565	[4] 69, 343	542, 630

Year beginning July—	Beef and its products, total [5]	Oleo oil	Cotton lint [6]	Linters [6]	Cottonseed cake and meal	Linseed cake and meal	Prunes	Raisins	Apples, fresh	Oranges	Sugar, raw and refined [7]
	1,000 pounds	*1,000 pounds*	*1,000 bales*	*1,000 bales*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 barrels*	*1,000 boxes*	*1,000 sh. tons*
1909–10	286, 296	126, 092	6, 413	------	640, 089	652, 317	89, 015	8, 526	922	932	63
1910–11	265, 924	138, 697	8, 068	------	804, 597	559, 675	51, 031	18, 660	1, 721	1, 179	28
1911–12	233, 925	126, 467	11, 070	------	1, 293, 690	596, 115	74, 328	19, 949	1, 456	1, 197	40
1912–13	170, 208	92, 850	9, 125	------	1, 128, 092	838, 120	117, 951	28, 121	2, 150	1, 063	22
1913–14	151, 212	97, 017	9, 522	------	799, 974	662, 869	69, 814	14, 766	1, 507	1, 559	26
1914–15	394, 981	80, 482	8, 581	226	1, 479, 065	524, 794	43, 479	24, 845	2, 352	1, 750	275
1915–16	457, 556	102, 646	5, 917	251	1, 057, 222	640, 916	57, 423	75, 015	1, 466	1, 575	815
1916–17	423, 674	67, 110	5, 702	474	1, 150, 160	536, 984	59, 645	51, 993	1, 740	1, 850	625
1917–18	600, 132	56, 603	4, 455	186	44, 681	151, 400	32, 027	54, 988	635	1, 240	288
1918–19	591, 302	59, 292	5, 442	84	311, 624	202, 788	59, 072	84, 160	1, 576	1, 402	558
1919–20	368, 002	74, 529	7, 035	52	449, 573	336, 336	114, 068	86, 857	1, 051	1, 619	722
1920–21	203, 815	106, 415	5, 570	53	454, 701	391, 264	57, 461	24, 492	2, 665	2, 001	292
1921–22	222, 462	117, 174	6, 592	126	532, 721	484, 059	109, 398	49, 639	1, 094	1, 641	1, 001
1922–23	194, 912	104, 956	5, 205	48	454, 350	574, 612	79, 229	93, 962	1, 756	1, 799	375
1923–24	185, 372	92, 965	5, 784	115	250, 368	560, 114	136, 448	88, 152	4, 098	2, 592	135
1924–25	190, 211	105, 145	8, 239	200	885, 375	691, 126	171, 771	90, 783	3, 201	2, 197	251
1925–26	152, 320	90, 410	8, 110	102	716, 505	589, 166	161, 405	135, 027	3, 672	2, 253	300
1926–27	151, 531	92, 720	11, 281	278	990, 516	625, 121	175, 544	152, 337	7, 098	3, 340	114
1927–28	106, 595	64, 851	7, 890	230	664, 523	606, 304	260, 625	193, 099	3, 144	2, 988	106
1928–29	101, 303	63, 187	8, 520	219	571, 200	645, 120	273, 051	221, 756	7, 014	4, 223	128
1929–30	102, 080	61, 088	7, 096	143	338, 240	624, 960	142, 989	128, 697	3, 426	3, 674	79
1930–31	98, 379	54, 960	7, 048	132	87, 360	304, 640	296, 254	125, 100	6, 780	3, 984	70
1931–32 [2]	79, 752	43, 762	8, 989	145	430, 080	441, 280	243, 935	122, 214	6, 010	3, 534	54

Footnotes at end of table.

TABLE 437.—*Exports of selected domestic agricultural products, annual 1909–10 to 1931–32*—Continued

Year beginning July—	Barley, including flour and malt [8]	Corn, including corn meal	Oats, including oatmeal	Rice, including flour, meal, and broken rice	Rye, including flour	Wheat, including flour	Tobacco, unmanufactured [9]	Glucose and grape sugar	Hops	Starch, including cornstarch
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1909–10	4,454	38,128	2,549	7,050	242	69,173	357,196	149,620	10,589	51,536
1910–11	9,507	65,015	3,846	15,575	40	71,338	355,327	181,963	13,105	158,239
1911–12	1,655	41,797	2,678	26,798	31	81,891	379,845	171,156	12,191	83,043
1912–13	17,874	50,780	36,455	24,601	1,855	145,159	418,707	200,149	17,591	110,668
1913–14	6,945	10,726	2,749	18,223	2,273	147,955	449,750	199,531	24,263	76,714
1914–15	28,712	50,668	100,609	75,449	13,027	335,702	348,346	158,463	16,210	107,037
1915–16	30,821	39,897	98,960	120,695	15,250	246,221	443,293	186,400	22,410	210,185
1916–17	20,319	66,753	95,106	181,372	13,703	205,962	411,599	214,973	4,825	146,424
1917–18	28,717	49,073	125,091	196,363	17,186	132,579	289,171	97,858	3,495	73,683
1918–19	26,997	23,019	100,005	193,128	36,467	287,402	629,288	136,230	7,467	143,788
1919–20	34,555	16,729	43,436	483,385	41,531	222,030	648,038	245,204	30,790	237,609
1920–21	27,255	70,906	9,891	440,855	47,337	369,313	506,526	141,954	22,206	135,365
1921–22	27,543	179,490	21,237	541,509	29,944	282,566	463,389	273,982	19,522	386,873
1922–23	21,909	96,596	25,413	370,670	51,663	224,900	454,384	162,693	13,497	260,796
1923–24	13,918	23,135	8,796	227,757	19,902	159,880	597,630	148,061	20,401	262,842
1924–25	28,543	9,791	16,777	112,037	50,242	260,803	430,702	139,577	18,122	214,247
1925–26	30,449	24,783	39,687	48,175	12,647	108,035	537,240	170,142	14,998	224,569
1926–27	19,655	19,819	15,041	304,358	21,697	219,160	516,401	148,789	13,369	233,111
1927–28	39,274	19,409	8,823	309,788	26,346	206,259	489,996	145,951	11,812	281,388
1928–29	60,295	41,870	16,251	392,684	9,488	163,687	565,925	123,366	8,830	235,660
1929–30	24,054	10,270	7,906	289,532	2,598	153,245	600,180	101,816	6,793	203,343
1930–31	11,443	3,317	3,123	281,005	227	131,475	591,035	70,571	5,593	104,907
1931–32 [2]	5,469	3,968	4,438	274,716	912	135,797	432,360	51,856	3,817	73,071

Year beginning July—	Cornstarch [10]	Apples, dried	Apricots, dried	Apricots, canned [11]	Pears, canned [11]	Peaches, canned [11]	Pineapples, canned [11]	Grapes	Pears, fresh [11]	Grapefruit, fresh
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 boxes*
1912–13	-----	41,575	35,017	-----	-----	-----	-----	-----	-----	-----
1913–14	-----	33,566	17,402	-----	-----	-----	-----	-----	-----	-----
1914–15	-----	42,589	23,764	-----	-----	-----	-----	-----	-----	-----
1915–16	-----	16,219	23,940	-----	-----	-----	-----	-----	-----	-----
1916–17	-----	10,358	9,841	-----	-----	-----	-----	-----	-----	-----
1917–18	38,659	2,603	5,230	-----	-----	-----	-----	-----	-----	-----
1918–19	106,727	18,909	20,975	-----	-----	-----	-----	-----	-----	-----
1919–20	163,315	11,819	26,768	-----	-----	-----	-----	-----	-----	-----
1920–21	110,514	18,053	8,332	-----	-----	-----	-----	-----	-----	-----
1921–22	348,940	12,431	16,736	-----	-----	-----	-----	[12] 173	-----	[12] 140
1922–23	254,060	12,617	11,193	[11] 13,809	49,358	54,624	21,846	14,022	36,785	252
1923–24	255,135	30,823	38,777	26,576	38,431	50,374	25,238	20,257	50,237	305
1924–25	209,865	19,225	13,292	31,360	53,851	57,390	26,252	20,302	41,452	427
1925–26	208,463	24,833	18,132	29,547	75,876	83,160	37,543	24,268	71,205	379
1926–27	212,375	32,670	17,901	35,896	66,104	81,896	37,426	30,791	73,877	613
1927–28	275,921	21,704	23,684	29,013	52,671	86,634	51,227	38,819	51,056	719
1928–29	231,667	60,024	24,652	26,249	82,652	101,438	47,533	55,638	82,847	940
1929–30	200,558	23,769	19,101	33,235	54,709	74,470	46,309	46,158	62,024	854
1930–31	102,886	38,120	23,647	19,024	74,355	75,763	35,308	49,799	134,670	1,222
1931–32 [2]	71,927	31,557	37,622	23,161	71,570	66,300	20,926	27,613	90,702	1,202

Bureau of Agricultural Economies. Compiled from *Foreign Commerce and Navigation of the United States*, 1914–1918, and Monthly Summary of Foreign Commerce of the United States, June issues 1921–1932.

Conversion factors used: Corn meal, 1 barrel = 4 bushels corn; oatmeal, 18 pounds = 1 bushel oats; rye flour, 1 barrel = 6 bushels rye; malt, 1.1 bushels = 1 bushel barley; wheat flour, 1 barrel = 1909–1917, 4.7 bushels grain; 1918 and 1919, 4.5 bushels; 1920, 4.6 bushels; 1921–1932, 4.7 bushels. Apples, 3 boxes = 1 barrel.

[1] Includes canned, fresh, salted, or pickled pork, lard, neutral lard, lard oil, bacon, and hams.
[2] Preliminary.
[3] Includes "Wiltshire sides."
[4] Wiltshire sides included with "Bacon."
[5] Includes canned, cured, and fresh beef, oleo oil, oleo stock, oleomargarine, tallow, and stearin from animal fats.
[6] Bales of 500 pounds gross; lint cotton and linters not separately reported prior to 1915.
[7] Includes maple sugar, 1919–1931.
[8] Includes barley flour 1919–1922. Barley flour not separately reported prior to 1919 nor since 1922.
[9] Includes "Stems, trimmings, and scrap tobacco."
[10] Included with "Starch" prior to 1917–18.
[11] Given in value only prior to 1922–23.
[12] Jan. 1 to June 30.

TABLE 438.—*Imports of selected agricultural products, annual 1909–10 to 1931–32*

Year beginning July—	Butter	Cheese	Beef and veal, fresh	Cattle hides		Goatskins	Total hides and skins (except furs)	Silk [1]	Cotton, unmanufactured	Wool, unmanufactured, including mohair, etc.	Total, tobacco, unmanufactured
				Wet	Dry						
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1909–10	1, 360	40, 818	(2)	318, 004		115, 845	608, 619	23, 457	86, 038	203, 928	46, 853
1910–11	1, 008	45, 569	(2)	95, 498	54, 630	86, 914	374, 891	26, 666	113, 768	137, 648	48, 203
1911–12	1, 026	46, 542	(2)	172, 881	78, 131	95, 341	537, 768	26, 585	109, 780	193, 401	54, 740
1912–13	1, 162	49, 388	(2)	185, 447	82, 595	96, 250	572, 197	32, 101	121, 852	195, 293	67, 977
1913–14	7, 842	63, 784	180, 137	208, 478	71, 485	84, 759	561, 071	34, 546	123, 347	247, 649	61, 175
1914–15	3, 828	50, 130	184, 491	241, 340	93, 001	66, 547	538, 218	31, 053	185, 205	308, 083	45, 809
1915–16	713	30, 088	71, 102	280, 839	153, 339	100, 657	743, 670	41, 925	232, 801	534, 828	48, 078
1916–17	524	14, 482	15, 217	225, 363	161, 237	105, 640	700, 207	40, 351	147, 062	372, 372	49, 105
1917–18	1, 806	9, 839	25, 452	190, 845	76, 655	66, 933	432, 517	43, 681	103, 326	379, 130	86, 991
1918–19	4, 131	2, 442	36, 670	220, 695	33, 182	89, 005	448, 142	50, 069	103, 592	422, 415	83, 951
1919–20	20, 771	17, 914	42, 436	328, 209	111, 252	126, 996	798, 569	58, 410	345, 314	427, 578	94, 005
1920–21	34, 344	16, 585	41, 956	173, 759	24, 814	41, 728	352, 193	34, 778	125, 939	318, 236	58, 923
1921–22	9, 551	34, 271	28, 001	186, 498	18, 438	83, 535	392, 904	57, 437	170, 165	255, 087	65, 225
1922–23	15, 772	54, 555	32, 481	346, 613	58, 770	89, 401	682, 893	63, 188	236, 092	525, 473	75, 786
1923–24	29, 466	66, 507	25, 144	158, 363	18, 112	65, 881	365, 194	56, 595	146, 024	239, 122	54, 497
1924–25	7, 189	61, 489	12, 419	184, 934	14, 376	65, 956	387, 447	70, 270	155, 092	284, 706	76, 870
1925–26	6, 440	62, 412	18, 279	141, 081	14, 506	86, 484	355, 266	76, 838	161, 454	345, 512	69, 974
1926–27	10, 710	89, 782	22, 098	145, 651	11, 287	83, 571	368, 876	85, 162	190, 963	271, 128	92, 983
1927–28	4, 955	75, 424	47, 650	280, 901	26, 461	84, 751	532, 379	87, 128	175, 450	248, 035	81, 045
1928–29	3, 299	84, 606	62, 481	202, 489	13, 859	94, 486	447, 384	90, 662	227, 454	270, 937	79, 284
1929–30	2, 851	78, 261	30, 190	284, 302	10, 530	101, 120	548, 567	87, 408	197, 657	220, 476	63, 181
1930–31	1, 329	57, 972	3, 551	87, 526	3, 581	80, 830	265, 854	87, 861	51, 192	149, 557	75, 425
1931–32 [3]	1, 838	57, 235	898	88, 385	3, 427	67, 102	254, 148	82, 503	66, 305	103, 941	73, 375

Year beginning July—	Rubber and similar gums, crude, total	Coffee	Tea	Cocoa or cacao beans	Bananas	Olives	Lemons	Onions	Tomatoes, fresh	Beans, dry
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bunches*	*1,000 gallons*	*1,000 boxes*	*1,000 bushels*	*1,000 pounds*	*1,000 bushels*
1909–10	154, 621	871, 470	85, 626	108, 668	38, 157	4, 555	2, 165	1, 024	(2)	1, 015
1910–11	145, 744	875, 367	102, 564	138, 058	44, 699	3, 045	1, 824	1, 515	(2)	1, 037
1911–12	175, 966	885, 201	101, 407	145, 969	44, 521	5, 077	1, 968	1, 436	(2)	1, 005
1912–13	170, 747	863, 131	94, 813	140, 039	42, 357	3, 946	2, 046	789	(2)	1, 048
1913–14	161, 777	1, 001, 528	91, 131	176, 268	48, 684	5, 316	(4)	1, 115	(2)	1, 634
1914–15	196, 122	1, 118, 691	96, 988	192, 307	41, 092	3, 622	(4)	829	(2)	906
1915–16	304, 183	1, 201, 104	109, 866	243, 232	36, 755	5, 938	(4)	816	(2)	663
1916–17	364, 914	1, 319, 871	103, 364	338, 654	34, 661	5, 642	(4)	1, 758	(2)	3, 748
1917–18	414, 984	1, 143, 891	151, 315	399, 040	34, 550	2, 385	(4)	1, 313	(2)	4, 146
1918–19	422, 215	1, 046, 029	108, 172	313, 037	35, 382	3, 501	(4)	152	(2)	4, 016
1919–20	660, 610	1, 414, 228	97, 828	420, 331	38, 848	5, 206	(4)	1, 884	(2)	3, 806
1920–21	371, 300	1, 348, 926	72, 196	327, 123	40, 808	4, 054	(4)	689	(2)	824
1921–22	578, 512	1, 238, 012	86, 142	317, 124	40, 120	(4)	1, 373	2, 488	(2)	520
1922–23	810, 028	1, 305, 188	96, 659	381, 508	44, 504	(4)	1, 660	1, 783	(2)	2, 623
1923–24	633, 489	1, 429, 617	105, 443	382, 971	44, 935	6, 848	1, 018	1, 406	[5] 50, 838	886
1924–25	824, 434	1, 279, 570	92, 779	382, 570	50, 513	5, 901	1, 264	2, 075	69, 216	1, 421
1925–26	962, 659	1, 437, 364	99, 411	417, 060	58, 550	5, 992	1, 247	2, 194	82, 448	1, 271
1926–27	993, 272	1, 444, 847	97, 402	425, 184	57, 102	5, 212	659	2, 298	124, 489	1, 051
1927–28	959, 245	1, 535, 392	90, 099	411, 543	64, 029	6, 458	1, 308	1, 399	113, 357	2, 465
1928–29	1, 252, 130	1, 435, 070	92, 635	419, 243	63, 530	6, 955	391	2, 050	128, 627	1, 505
1929–30	1, 157, 817	1, 562, 058	86, 368	421, 938	65, 909	8, 452	1, 229	918	139, 886	2, 534
1930–31	1, 048, 758	1, 728, 569	87, 148	415, 442	57, 841	7, 429	350	214	113, 480	1, 346
1931–32 [3]	1, 098, 501	1, 628, 841	90, 459	434, 853	51, 785	7, 064	176	665	122, 215	222

Footnotes at end of table.

TABLE 438.—*Imports of selected agricultural products, annual 1909–10 to 1931–32*—Continued

Year beginning July—	Almonds in terms of shelled [6]	Peanuts in terms of shelled [6]	Walnuts in terms of shelled [6]	Coconut meat [7]	Flaxseed	Sugar, raw and refined	Molasses	Jute and jute butts, unmanufactured	Manila or abaca	Sisal and henequen
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 bushels*	*1,000 short tons*	*1,000 gallons*	*1,000 long tons*	*1,000 long tons*	*1,000 long tons*
1909–10	18,556	29,276	33,641	21,306	5,002	2,047	31,292	68	93	100
1910–11	15,523	18,634	33,619	37,817	10,499	1,969	23,838	65	74	112
1911–12	17,231	11,248	37,214	69,912	6,842	2,052	28,828	101	69	114
1912–13	13,856	14,989	17,213	40,870	5,294	2,370	33,927	125	74	154
1913–14	15,027	38,728	20,800	55,735	8,653	2,533	51,410	106	50	216
1914–15	13,679	19,338	20,490	96,485	10,666	2,710	70,840	83	51	186
1915–16	14,546	25,407	23,733	118,613	14,079	2,817	85,717	106	79	229
1916–17	19,916	32,385	23,839	256,801	12,394	2,666	110,238	113	77	143
1917–18	20,845	75,403	16,252	507,576	13,367	2,452	130,731	78	86	150
1918–19	25,615	20,425	9,057	315,749	8,427	2,918	130,075	63	68	153
1919–20	28,533	128,390	28,961	258,229	23,392	3,798	154,670	77	77	176
1920–21	15,861	46,202	15,902	213,134	16,170	3,506	113,414	90	52	159
1921–22	28,036	9,678	35,174	294,104	13,632	4,232	87,908	62	44	72
1922–23	24,345	45,013	25,970	338,597	25,006	4,307	161,135	85	98	98
1923–24	24,207	50,683	26,428	344,920	19,577	3,765	174,037	84	98	97
1924–25	22,503	93,191	36,623	371,961	13,419	4,337	215,778	56	73	146
1925–26	19,686	36,026	31,698	444,278	19,354	4,420	256,246	71	62	126
1926–27	15,890	49,792	31,776	507,136	24,224	4,420	260,259	89	61	116
1927–28	18,496	63,783	20,347	518,173	18,112	4,045	248,427	81	48	124
1928–29	18,673	80,412	24,500	687,121	23,494	4,753	296,550	92	60	135
1929–30	19,956	9,941	20,228	546,868	19,652	3,641	253,114	80	73	113
1930–31	13,264	9,002	17,818	606,087	7,813	3,287	217,001	49	43	84
1931–32 [3]	8,339	1,407	13,042	487,223	13,850	3,262	205,967	52	27	109

Year beginning July	Milk and cream, fresh	Cream, fresh	Eggs, whole, in the shell	Eggs and egg yolks, dried, frozen, or prepared	Whole eggs, dried	Whole eggs, frozen	Yolks, dried	Yolks, frozen	Egg albumen, dried	Egg albumen, frozen, prepared, and preserved	Hair of the Angora (mohair)
	1,000 gallons	*1,000 gallons*	*1,000 dozen*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1912–13	(2)	1,247	1,367	228	-------	-------	-------	-------	(2)	-------	-------
1913–14	(2)	1,773	6,015	3,420	-------	-------	-------	-------	(2)	-------	-------
1914–15	(2)	2,077	3,047	8,572	-------	-------	-------	-------	(2)	-------	-------
1915–16	(2)	1,194	733	6,022	-------	-------	-------	-------	(2)	-------	-------
1916–17	(2)	744	1,110	10,318	-------	-------	-------	-------	(2)	-------	-------
1917–18	(2)	712	1,619	14,598	-------	-------	-------	-------	(2)	-------	-------
1918–19	2,592	(2)	848	9,085	-------	-------	-------	-------	(2)	-------	-------
1919–20	3,989	(2)	1,348	24,091	-------	-------	-------	-------	(2)	-------	-------
1920–21	4,391	(2)	3,316	28,768	-------	-------	-------	-------	(2)	-------	-------
1921–22	4,536	(2)	1,224	16,540	-------	-------	-------	-------	7,388	-------	-------
1922–23	5,148	(2)	535	14,821	-------	-------	-------	-------	3,213	-------	[8] 7,220
1923–24	6,623	[5] 1,646	426	[9] 14,830	[7] 544	[5] 1,106	[5] 522	[5] 1,210	6,642	[5] 636	3,583
1924–25	6,418	4,765	682	-------	1,884	8,751	4,281	4,151	3,257	1,106	2,404
1925–26	7,479	4,798	276	-------	1,365	12,647	6,004	5,662	4,490	5,119	6,463
1926–27	6,106	5,273	296	-------	1,132	8,114	4,468	4,601	3,859	3,967	6,547
1927–28	5,425	4,819	256	-------	575	611	3,486	1,229	2,361	553	2,204
1928–29	5,016	3,173	291	-------	2,133	12,616	5,130	4,581	2,898	610	3,184
1929–30	3,314	2,474	337	-------	1,839	9,824	7,819	3,475	4,363	9,955	1,073
1930–31	1,190	844	301	-------	822	113	6,069	1,052	2,219	2	474
1931–32 [3]	280	118	282	-------	543	2	1,920	443	1,722	(10)	0

Bureau of Agricultural Economics. Compiled from Commerce and Navigation of the United States 1914–1918, and Monthly Summary of Foreign Commerce, June issue, 1919–1932.

[1] Includes "Silk, raw or as reeled from cocoon," "Silk waste," and "Silk cocoons."
[2] Not separately classified.
[3] Preliminary.
[4] Reported in value only.
[5] Beginning Jan. 1, 1924.
[6] Conversion factors used: Almonds, 30 per cent unshelled equals shelled. Peanuts, 3 pounds unshelled equals 2 pounds shelled. Walnuts, 42 per cent unshelled equals shelled.
[7] Includes broken, or shredded, desiccated, or prepared, and copra.
[8] Beginning Sept. 22, 1922.
[9] July 1–Dec. 31, 1923.
[10] Less than 500.

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32[1]
ANIMAL AND ANIMAL PRODUCTS						
Butter:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United Kingdom	0	20	5	20	80	(2)
Honduras	150	143	157	164	151	139
Panama	582	311	227	342	157	135
Mexico	859	724	672	617	426	179
Cuba	754	479	370	96	6	9
Haiti, Republic of	498	479	479	458	394	401
Other West Indies[3]	550	391	394	380	270	244
Colombia	163	143	164	122	61	23
Peru	356	358	451	371	67	57
Venezuela	381	190	264	329	269	119
Philippine Islands	187	190	152	210	154	84
Other countries	588	537	443	473	258	186
Total	5,048	3,965	3,778	3,582	2,293	1,578
Cheese:						
Panama	434	432	460	485	442	535
Mexico	670	581	423	506	293	133
Canada	350	209	170	176	179	84
Honduras	68	69	82	105	86	73
British Honduras	67	72	76	64	61	52
Cuba	832	359	405	170	72	143
Virgin Islands	62	65	70	65	54	62
Haiti, Republic of	86	80	72	58	59	51
Other West Indies[3]	331	186	218	129	94	69
China	252	145	89	45	29	39
Philippine Islands	110	146	130	134	143	158
Other countries	511	479	377	402	221	208
Total	3,773	2,873	2,572	2,339	1,733	1,607
Milk:						
Condensed—						
Total Europe	424	151	70	21	14	6
Cuba	12,843	11,462	13,103	13,196	3,651	1,378
Philippine Islands	6,471	7,575	7,339	7,347	7,566	5,817
Japan	4,029	5,385	5,473	4,701	4,167	3,543
Hong Kong	2,065	3,764	3,739	3,905	2,372	2,339
China	3,621	2,513	2,840	2,173	1,319	886
Mexico	1,308	985	883	1,055	605	281
Jamaica	754	467	523	380	612	595
Honduras	319	402	549	550	515	384
Costa Rica	566	595	746	524	370	208
Venezuela	369	439	550	480	452	298
Other countries	3,030	3,237	3,750	3,439	1,291	805
Total	35,799	36,975	39,565	37,771	22,934	16,540
Evaporated—						
United Kingdom	27,418	23,805	21,759	11,877	15,978	15,287
Other Europe	3,109	596	508	457	367	218
Total Europe	30,527	24,401	22,267	12,334	16,345	15,505
Philippine Islands	12,806	15,563	15,372	17,153	18,684	16,279
Panama	4,127	3,589	4,606	4,805	2,898	4,308
Peru	4,215	3,569	4,027	3,602	1,583	1,355
China	3,025	3,035	3,447	2,056	816	529
British Malaya	1,932	2,817	2,761	3,359	1,026	592
Cuba	2,958	2,647	2,272	2,935	486	207
Japan	1,616	2,466	2,544	2,785	2,867	2,446
Mexico	2,714	2,157	2,185	2,274	1,296	685
Netherland West Indies	672	834	1,488	1,765	988	1,235
Netherland East Indies	1,221	1,389	1,422	1,991	1,772	1,256
Siam	606	1,426	1,119	1,363	748	1,242
Newfoundland and Labrador	797	1,103	1,035	966	970	808
Other countries	5,927	6,972	7,349	6,413	5,573	2,593
Total	73,143	71,968	72,894	63,801	56,062	49,040
Bacon, including Cumberland sides:[4]						
United Kingdom	68,220	60,127	53,364	57,443	26,203	10,403
Germany	6,818	9,838	5,982	8,468	1,151	2,043
Italy	1,439	8,113	15,106	8,289	764	822
Finland	4,493	6,075	4,633	3,734	1,549	722
Norway	2,422	3,244	2,742	2,642	712	174
Sweden	5,061	4,689	3,649	4,648	3,264	946

[1] Preliminary.
[2] Less than 500.
[3] Excludes Bermudas.
[4] Beginning July 1, 1931, includes "Wiltshire sides."

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
ANIMAL AND ANIMAL PRODUCTS—con.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Bacon—Continued.						
Irish Free State	64	402	933	2,273	1,126	206
Netherlands	2,502	632	1,198	2,959	61	657
Other Europe	7,542	16,434	15,628	15,933	582	255
Total Europe	98,561	99,554	103,235	106,389	35,412	16,298
Cuba	21,070	19,107	16,698	15,957	12,398	7,128
Canada	4,584	5,173	5,769	5,617	2,335	650
Panama	228	341	401	499	421	330
Newfoundland and Labrador	1,181	731	626	557	372	278
Mexico	285	221	225	233	189	114
Other countries	1,634	1,840	2,291	2,419	1,285	777
Total	127,543	126,967	129,245	131,670	52,412	25,565
Hams and shoulders, including Wiltshire sides: [6]						
United Kingdom	124,391	104,020	100,959	103,169	81,294	58,126
Belgium	451	660	1,003	2,136	1,464	607
Other Europe	1,424	1,846	2,024	1,155	236	193
Total Europe	126,266	106,526	103,986	106,460	82,994	58,926
Cuba	6,548	8,167	7,435	6,307	4,272	4,559
Canada	4,803	6,134	6,309	11,370	5,895	694
Other countries	6,032	6,992	7,666	7,435	6,588	5,164
Total	143,649	127,819	125,396	131,572	99,749	69,343
Pork:						
Canned—						
United Kingdom	5,595	7,632	6,555	10,737	9,066	8,751
Other Europe	80	97	145	238	193	78
Total Europe	5,675	7,729	6,700	10,975	9,259	8,829
Philippine Islands	48	32	36	64	112	173
Canada	188	179	244	241	225	101
China	11	7	7	145	127	167
Panama	14	15	23	39	90	169
Other countries	795	652	964	1,319	739	580
Total	6,731	8,614	7,974	12,783	10,552	10,019
Fresh—						
United Kingdom	7,128	6,418	4,547	10,527	8,098	6,672
Other Europe	260	1,002	2,515	3,685	464	241
Total Europe	7,388	7,420	7,062	14,212	8,562	6,913
Cuba	1,763	1,557	1,732	1,618	424	161
Canada	590	798	582	1,091	410	72
Panama	420	558	444	763	771	1,430
Philippine Islands	143	194	288	239	222	257
Other countries	577	532	533	858	704	439
Total	10,881	11,059	10,641	18,771	11,093	9,272
Pickled—						
United Kingdom	3,857	5,184	7,608	5,094	2,945	1,585
Norway	394	722	854	799	364	210
Germany	134	289	366	328	89	54
Other Europe	416	821	1,420	1,194	327	279
Total Europe	4,801	7,016	10,248	7,415	3,725	2,128
Cuba	7,760	7,626	10,550	9,798	4,862	1,923
Canada	5,800	7,056	8,596	11,211	4,356	3,058
Newfoundland and Labrador	3,532	3,734	4,530	4,792	3,681	3,423
British West Indies and Bermudas	2,730	2,851	2,810	221	2,226	2,464
Haiti, Republic of	917	1,055	838	719	544	513
Other countries	2,422	2,312	2,334	5,677	1,724	1,720
Total	27,962	31,650	39,906	39,833	21,118	15,229
Lard:						
United Kingdom	222,086	233,564	229,899	240,147	256,353	239,358
Germany	174,621	176,771	195,695	180,074	107,317	142,354
Netherlands	46,071	35,784	36,992	48,584	26,478	29,080
Italy	7,642	20,384	29,200	19,865	6,064	7,125
Belgium	12,718	14,541	14,841	18,700	9,406	5,750
Other Europe	26,238	38,144	49,070	56,031	14,791	8,799
Total Europe	489,376	519,188	555,697	563,401	420,409	433,366
Cuba	79,599	78,469	84,316	79,860	49,004	88,406
Mexico	41,963	52,475	56,728	68,531	67,491	35,483

[6] Beginning July 1, 1931, "Wiltshire sides" included with "Bacon, including Cumberland sides."

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
ANIMAL AND ANIMAL PRODUCTS—con.						
Lard—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Colombia	12, 623	15, 782	23, 375	19, 479	11, 836	4, 284
Canada	14, 888	16, 172	17, 864	15, 112	12, 224	6, 197
Other countries	37, 363	34, 312	42, 934	40, 777	24, 706	24, 894
Total	675, 812	716, 398	780, 914	787, 160	585, 670	542, 630
Lard, neutral:						
Netherlands	5, 260	6, 784	4, 710	6, 260	3, 264	2, 554
Germany	5, 895	5, 623	4, 023	3, 010	1, 421	1, 152
United Kingdom	3, 530	5, 096	3, 919	2, 320	1, 526	745
Norway	1, 039	1, 228	895	755	529	455
Denmark	726	1, 176	894	1, 379	1, 453	804
Sweden	912	698	649	787	766	765
Other Europe	921	1, 206	1, 463	1, 197	1, 015	916
Total Europe	18, 283	21, 809	16, 553	15, 708	9, 974	7, 391
Other countries	1, 774	1, 990	1, 762	1, 075	785	299
Total	20, 057	23, 799	18, 315	16, 783	10, 759	7, 690
Oleo oil:						
Germany	25, 443	18, 267	16, 835	14, 630	13, 934	11, 570
Netherlands	27, 270	17, 608	16, 744	22, 158	15, 868	11, 698
United Kingdom	18, 691	16, 092	16, 328	11, 735	13, 179	9, 883
Norway	5, 460	3, 596	2, 763	2, 549	2, 018	1, 500
Greece	3, 972	454	602	750	1, 587	1, 519
Belgium	1, 875	1, 576	1, 780	1, 470	1, 837	1, 716
Denmark	2, 691	2, 079	2, 062	2, 865	2, 408	2, 134
Other Europe	2, 726	1, 939	2, 367	1, 883	1, 808	1, 415
Total Europe	88, 128	61, 611	59, 481	58, 040	52, 639	41, 435
Other countries	4, 592	3, 240	3, 706	3, 053	2, 322	2, 327
Total	92, 720	64, 851	63, 187	61, 093	54, 961	43, 762
VEGETABLE PRODUCTS						
Cotton, excluding linters:	*1,000 bales* [6]	*1,000 bales* [6]	*1,000 bales* [6]	*1,000 bales* [6]	*1,000 bales* [6]	*1,000 bales* [6]
Germany	2, 829	2, 090	1, 891	1, 770	1, 752	1, 629
United Kingdom	2, 623	1, 443	1, 918	1, 306	1, 108	1, 314
France	1, 063	904	841	860	986	487
Italy	841	708	765	705	495	673
Belgium	286	213	217	182	143	143
Spain	259	321	301	285	268	309
Netherlands	251	144	168	143	147	157
Other Europe	661	605	497	316	214	297
Total Europe	8, 813	6, 428	6, 598	5, 567	5, 113	5, 009
Japan	1, 644	1, 007	1, 373	1, 071	1, 233	2, 396
China	262	136	245	232	393	1, 143
Other countries	562	319	304	226	309	441
Total	11, 281	7, 890	8, 520	7, 096	7, 048	8, 989
Linters:						
Germany	154	132	120	70	56	59
France	26	36	32	26	27	24
United Kingdom	51	22	16	7	11	16
Belgium	12	7	12	8	5	1
Other Europe	15	15	18	14	14	16
Total Europe	258	212	198	125	113	116
Canada	20	18	19	17	16	14
Other countries	0	1	2	1	3	15
Total	278	231	219	143	132	145
Fruits:						
Dried—						
Apples—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Germany	12, 158	10, 877	22, 085	11, 425	18, 470	12, 055
Netherlands	9, 568	3, 315	12, 451	4, 323	8, 763	8, 154
Sweden	2, 278	2, 524	2, 985	3, 015	1, 846	2, 501
Denmark	1, 371	1, 384	1, 674	894	1, 161	1, 429
United Kingdom	2, 282	1, 018	2, 618	1, 522	1, 755	2, 198
Other Europe	3, 656	1, 617	6, 995	1, 880	5, 598	4, 656
Total Europe	31, 313	20, 735	48, 808	23, 059	37, 593	30, 993
Other countries	1, 357	969	1, 216	710	528	564
Total	32, 670	21, 704	50, 024	23, 769	38, 121	31, 557

[6] Bales of 500 pounds.

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Fruits—Continued.						
Dried—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Apricots—						
Germany	4,593	6,512	7,742	6,091	8,695	11,798
Netherlands	3,316	4,651	3,750	2,493	2,933	3,913
United Kingdom	2,084	1,964	1,422	1,019	1,243	2,789
Belgium	1,038	1,374	1,691	891	1,932	2,007
Norway	945	1,280	988	1,327	786	1,389
Sweden	952	994	776	939	835	1,151
Denmark	1,962	2,469	1,959	2,066	2,290	3,369
France	409	1,273	3,015	1,310	2,458	7,139
Other Europe	477	661	936	728	820	1,370
Total Europe	15,776	21,158	22,279	16,864	21,992	34,925
Canada	1,257	1,920	1,614	1,431	1,036	1,833
Other countries	868	606	759	806	619	864
Total	17,901	23,684	24,652	19,101	23,647	37.622
Prunes—						
Germany	38,353	79,732	77,883	44,789	97,631	62,539
United Kingdom	40,173	45,601	40,836	28,143	39,824	42,757
France	27,217	27,390	59,822	9,298	46,571	46,882
Netherlands	10,242	23,140	17,286	5,894	18,903	9,309
Sweden	6,854	7,047	5,434	6,744	8,712	8,788
Italy	1,368	5,533	7,700	2,867	15,851	13,282
Denmark	6,136	9,992	6,611	6,034	9,426	7,985
Belgium	6,019	9,402	9,885	3,387	9,014	6,652
Norway	2,590	5,036	3,685	3,019	5,313	5,063
Other Europe	6,558	10,701	11,652	6,992	15,970	14,935
Total Europe	145,710	223,574	240,794	118,857	267,815	218,172
Canada	20,454	23,272	18,966	16,187	16,456	17,161
Other countries	9,380	13,779	13,292	9,945	11,983	8,602
Total	175,544	260,625	273,051	142,989	296,254	243,935
Raisins—						
United Kingdom	49,991	70,034	71,375	36,443	40,293	48,458
Germany	16,039	18,733	23,022	14,069	14,628	16,899
Netherlands	13,857	18,698	24,278	7,436	8,827	7,315
Denmark	1,994	1,593	2,244	1,286	1,385	1,834
Belgium	4,318	5,543	6,074	2,268	2,773	2,904
France	2,144	3,496	4,455	2,750	3,303	3,507
Sweden	6,065	10,285	14,782	9,639	10,510	8,916
Other Europe	3,309	3,643	6,565	3,734	3,221	4,577
Total Europe	97,714	131,925	152,785	77,615	84,940	94,410
Canada	37,400	40,148	39,635	28,668	22,894	14,576
China	3,549	4,144	7,574	4,791	1,816	1,627
Japan	2,901	3,066	2,961	2,992	2,140	1,922
Other countries	10,873	13,796	18,801	14,631	13,310	9,678
Total	152,337	193,099	221,756	128,697	125,100	122,213
Fresh—	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*
Apples—						
United Kingdom	3,305	1,004	1,720	953	954	1,893
Germany	361	27	236	50	404	73
Netherlands	141	2	201	17	334	49
Belgium	80	1	321	14	313	189
France	4	(3)	62	8	131	367
Denmark	151	42	81	41	65	73
Other Europe	112	108	165	126	67	117
Total Europe	4,154	1,184	2,786	1,209	2,268	2,761
Other countries	329	165	219	218	211	57
Total	4,483	1,349	3,005	1,427	2,479	2,818
	1,000 boxes	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Apples—						
United Kingdom	3,723	2,709	4,836	2,655	3,991	3,475
Germany	1,237	737	2,695	946	3,476	1,988
Netherlands	670	72	1,687	272	2,417	1,308
France	6	1	77	49	677	913
Other Europe	506	506	762	549	824	771
Total Europe	6,142	4,025	10,057	4,471	11,385	8,450

[3] Less than 500.

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Fruits—Continued.	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*
Apples—Continued.	*boxes*	*boxes*	*boxes*	*boxes*	*boxes*	*boxes*
Canada	730	542	636	500	475	238
Argentina	155	227	336	294	261	167
Brazil	172	115	212	224	170	127
Philippine Islands	120	88	150	88	112	105
Other countries	525	387	635	421	501	380
Total	7,844	5,384	12,026	5,098	12,904	9,467
Oranges—						
United Kingdom	403	402	709	796	669	628
Canada	2,636	2,346	3,151	2,568	2,873	2,470
Other countries	301	240	363	310	442	436
Total	3,340	2,988	4,223	3,674	3,984	3,534
Grapefruit—						
United Kingdom	310	333	561	496	741	692
Canada	264	349	335	308	408	453
Germany	8	6	8	10	23	13
France	4	4	4	5	7	6
Other countries	27	27	32	35	43	38
Total	613	719	940	854	1,222	1,202
	1,000	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*
Canned—	*pounds*	*pounds*	*pounds*	*pounds*	*pounds*	*pounds*
United Kingdom	203,016	177,256	236,754	203,151	215,575	215,843
Other Europe	29,691	38,539	47,646	40,171	26,667	23,592
Total Europe	232,707	215,795	284,400	243,322	242,242	239,435
Canada	15,491	17,993	22,769	20,438	13,693	2,203
Other countries	22,172	22,088	22,654	19,957	15,161	8,187
Total	270,370	255,876	320,823	283,717	271,096	249,825
Grains and grain products:	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*	*1,000*
Barley (grain)—	*bushels*	*bushels*	*bushels*	*bushels*	*bushels*	*bushels*
Germany	2,066	11,599	13,085	1,521	0	77
United Kingdom	8,981	10,151	13,161	9,370	8,670	4,237
Netherlands	815	2,581	3,909	479	8	234
Belgium	1,576	642	1,782	651	775	171
Other Europe	816	634	749	756	537	162
Total Europe	14,254	25,607	32,686	12,777	9,990	4,881
Canada	2,184	10,453	23,886	8,144	9	116
Other countries	606	520	424	623	303	87
Total	17,044	36,580	56,996	21,544	10,302	5,084
Corn (grain)—						
Netherlands	560	4,311	7,977	128	50	65
Germany	2	2,520	4,241	0	69	114
United Kingdom	1,268	1,885	8,237	20	8	322
Denmark	563	845	896	0	1	0
Canada	10,536	6,454	11,082	7,390	1,414	2,681
Cuba	2,016	1,021	765	226	18	2
Mexico	2,124	323	572	1,297	823	7
Other countries	494	1,015	6,974	295	146	153
Total	17,563	18,374	40,744	9,354	2,529	3,344
Oats (grain)—						
United Kingdom	1,259	645	1,177	13	0	0
Belgium	352	123	257	0	0	0
Germany	297	115	0	0	0	0
France	239	44	141	0	0	0
Other Europe	385	316	1,620	2	0	2
Total Europe	2,532	1,243	3,195	15	0	2
Canada	5,198	3,426	6,501	3,913	680	1,952
Cuba	1,170	1,028	861	490	61	352
Mexico	132	98	51	44	35	34
Other countries	213	239	240	173	131	139
Total	9,245	6,034	10,848	4,635	907	2,479

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Grain and grain products—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Oatmeal—						
United Kingdom	18,695	14,447	23,775	8,358	4,833	8,990
Finland	13,219	9,471	17,335	8,441	431	2,569
Netherlands	25,930	7,485	14,525	7,604	9,479	6,958
Belgium	4,738	2,890	3,064	801	1,955	1,775
Other Europe	12,036	5,456	9,249	2,637	1,160	1,300
Total Europe	74,806	39,749	67,948	28,041	17,858	21,292
South America	1,164	9,757	11,289	10,431	8,093	5,101
Mexico	4,027	3,739	3,802	4,054	3,202	1,640
Canada	1,913	3,582	1,556	5,402	1,046	812
British India	850	1,770	1,594	2,013	1,400	926
Other countries	21,574	9,595	10,956	10,012	8,287	5,483
Total	104,334	68,192	97,245	59,953	39,886	35,254
Rice (grain)—						
Germany	36,917	35,851	43,799	37,915	34,527	41,670
United Kingdom	33,675	35,459	41,812	35,854	32,364	35,716
Belgium	18,764	12,778	23,167	8,959	14,735	11,994
France	5,169	12,388	16,065	13,419	18,167	22,190
Netherlands	17,380	23,660	19,427	15,090	18,155	11,672
Greece	4,331	1,574	6,739	4,662	8,479	12,302
Sweden	1,255	4,801	7,500	2,638	4,103	4,157
Denmark	1,822	3,267	6,770	3,861	2,397	2,574
Other Europe	2,595	4,041	7,748	9,161	9,743	10,397
Total Europe	121,914	133,819	173,117	131,749	142,690	152,672
South America	24,847	41,205	78,719	69,297	54,899	17,618
Central America	3,468	5,888	5,852	5,031	4,607	2,678
Japan	68,518	2,020	14,609	935	378	363
Canada	7,525	14,227	19,800	18,239	17,342	20,323
Other countries	8,276	33,273	21,308	9,908	4,633	20,819
Total	234,548	230,432	313,405	235,159	224,549	214,473
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Rye (grain)—						
United Kingdom	2,345	1,710	1,174	21	0	0
Netherlands	1,768	1,408	868	0	21	278
Germany	1,577	1,245	364	21	0	290
Denmark	510	466	406	69	48	54
Norway	489	298	57	3	0	0
France	289	145	13	11	17	0
Belgium	441	135	9	0	41	0
Italy	0	0	0	0	40	0
Other Europe	66	567	490	17	1	0
Total Europe	7,485	5,974	3,381	142	108	622
Canada	14,118	20,080	5,913	2,347	0	223
Other countries	10	10	52	49	11	7
Total	21,613	26,064	9,346	2,538	179	852
Wheat (grain)—						
United Kingdom	39,341	36,574	16,276	23,931	17,863	15,112
Netherlands	17,131	11,559	5,149	6,197	6,943	8,681
Italy	10,407	10,450	5,047	905	3,675	1,441
Belgium	8,926	8,797	3,232	6,314	7,394	10,707
Germany	7,287	5,562	1,674	4,769	1,722	3,530
France	16,079	5,127	2,215	2,214	7,859	6,148
Greece	4,816	2,819	3,592	7,009	3,379	11,149
Irish Free State	4,282	3,118	3,551	3,088	2,146	1,180
Other Europe	2,929	5,177	5,909	2,252	991	573
Total Europe	111,198	89,203	46,645	56,679	51,972	58,521
Canada	26,793	45,563	41,190	16,777	12,493	5,799
Japan	7,336	6,304	3,782	9,185	3,063	1,646
China	1,099	0	1,241	140	1,872	14,350
Other countries	9,624	4,929	10,256	9,394	6,965	16,205
Total	156,250	145,999	103,114	92,175	76,365	96,521

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year begining July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Grain and grain products—Continued.	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*
Wheat flour—						
Netherlands	1,568	1,530	1,084	1,031	1,297	178
United Kingdom	1,733	1,224	880	1,560	1,378	775
Germany	834	534	312	452	243	145
Greece	282	113	49	30	12	7
Irish Free State	94	62	39	145	155	117
Denmark	439	528	423	535	508	284
Finland	480	482	400	341	282	139
Norway	336	324	259	363	313	273
Other Europe	297	290	256	283	358	120
Total Europe	6,063	5,093	3,708	4,740	4,546	2,038
Cuba	1,199	1,216	1,204	1,199	968	871
Other West Indies [1]	747	676	809	663	590	550
Hong Kong	618	929	868	752	843	680
Brazil	904	873	831	780	671	113
China	418	790	1,242	553	955	1,740
Philippine Islands	666	727	802	730	640	630
Central America	613	697	752	684	658	596
Kwantung	189	136	428	891	382	96
Venezuela	175	201	248	295	254	242
Egypt	337	173	220	205	185	163
Other countries	1,456	1,310	1,776	1,502	1,034	638
Total	13,385	12,821	12,888	12,994	11,726	8,357
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Hops—						
United Kingdom	4,559	6,121	4,175	3,255	2,745	2,359
Belgium	1,892	255	129	93	77	37
Irish Free State	702	583	974	613	795	709
Other Europe	2,225	759	59	40	111	10
Total Europe	9,378	7,718	5,337	4,001	3,728	3,175
Canada	2,772	3,168	2,838	2,522	1,685	566
Other countries	1,219	926	661	270	180	76
Total	13,369	11,812	8,836	6,793	5,593	3,817
Oil cake and oil-cake meal:						
Cottonseed cake—						
Denmark	345,747	450,524	319,596	168,488	67,820	281,015
Germany	215,887	58,778	49,844	39,505	0	28,054
Other Europe	23,892	17,611	25,790	3,371	21	13,652
Total Europe	585,526	526,913	395,230	211,364	67,841	322,721
Other countries	13,922	110	27	202	2,918	179
Total	599,448	527,023	395,257	211,566	70,759	322,900
Cottonseed meal—						
United Kingdom	150,699	45,844	60,084	46,955	3,297	30,180
Germany	127,687	39,157	46,312	19,752	0	18,947
Norway	28,746	11,655	10,192	1,019	112	21,056
Irish Free State	18,638	5,611	9,708	14,305	0	12,795
France	689	493	4,048	2,296	1,120	1,400
Netherlands	25,299	12,356	16,900	7,417	168	3,620
Belgium	8,404	4,360	7,892	3,261	1,010	3,214
Other Europe	458	7,282	7,513	3,143	1	4,061
Total Europe	360,620	126,758	162,739	98,148	5,708	95,293
Canada	22,177	9,686	12,956	26,347	8,543	8,776
Other countries	8,271	1,054	1,720	4,112	2,247	3,303
Total	391,068	137,498	177,415	128,607	16,498	107,372
Linseed or flaxseed cake—						
Netherlands	381,104	305,321	371,385	323,537	141,505	206,188
Belgium	171,487	235,883	204,205	184,958	89,849	139,637
United Kingdom	45,522	38,698	40,392	48,745	42,495	21,728
Other Europe	11,281	9,151	8,104	42,116	15,306	54,754
Total Europe	609,394	589,053	624,086	599,386	289,155	422,307
Other countries	126	121	827	2,433	591	1,035
Total	609,520	589,174	624,913	601,819	289,746	423,342

[1] Excludes Bermudas.

TABLE 439.—*Principal agricultural products exported from the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country to which exported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Oils, vegetable:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Cottonseed—						
Canada	37,683	49,407	20,550	24,666	9,152	28,572
Mexico	3,868	5,318	2,374	947	3,954	450
Cuba	2,770	2,033	1,836	2,448	9,856	7,797
Argentina	2,160	1,108	912	253	94	3
Japan	925	831	911	1,179	1,146	1,602
Panama	742	719	788	1,063	768	900
Other countries	9,432	2,054	2,160	1,442	1,384	1,661
Total	57,580	61,470	29,531	31,998	26,353	40,985
Sugar, refined:	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
United Kingdom	37	35	24	25	23	24
Norway	15	13	14	6	2	3
France	5	1	2	1	2	1
Netherlands	3	4	5	5	5	4
Other Europe	7	8	1	3	2	2
Total Europe	67	61	46	40	34	34
Uruguay	19	13	26	6	7	3
West Indies and Bermudas	4	5	6	5	5	4
British Africa	5	5	12	6	5	4
Canada	2	4	7	3	2	1
Mexico	4	2	5	4	1	(2)
Panama	2	2	2	3	4	5
Newfoundland and Labrador	1	1	2	(2)	2	2
Colombia	2	7	13	6	5	(2)
Chile	2	2	2	1	(2)	(2)
Other countries	6	4	7	5	5	1
Total	114	106	128	79	70	54
Tobacco, leaf:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Bright flue-cured—						
United Kingdom	134,886	157,506	171,515	186,583	184,448	129,399
Germany	11,105	13,378	13,841	8,150	12,274	7,610
Other Europe	17,753	21,197	25,197	39,932	28,172	25,122
Total Europe	163,744	192,081	210,553	234,665	224,894	162,131
China [7]	71,760	66,842	131,254	128,144	143,989	77,433
Australia	19,307	21,488	18,146	19,492	23,173	11,007
Canada	11,984	14,049	14,601	13,660	11,210	10,680
Japan	8,553	11,565	14,564	10,395	11,604	4,128
British India	4,538	5,031	5,884	3,874	1,182	3,721
Other countries	8,785	15,878	18,947	19,712	16,656	16,388
Total	288,671	326,924	413,949	429,942	432,688	285,488

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce, United States, January and June issues, 1926–1932 and official records of the Bureau of Foreign and Domestic Commerce.

[2] Less than 500.
[7] Includes Hong Kong and Kwantung.

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32 [1]
ANIMALS AND ANIMAL PRODUCTS						
Cattle:	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Mexico	99	204	309	226	56	79
Canada	168	343	256	192	26	24
Other countries	0	1	1	1	1	(2)
Total	267	548	566	419	83	103
Butter:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Denmark	1,520	761	902	1,109	172	210
United Kingdom	3,932	870	58	171	17	38
Other Europe	192	453	279	38	26	34
Total Europe	5,653	2,084	1,239	1,318	215	282
New Zealand	3,682	2,396	1,674	1,141	877	729
Canada	610	275	237	142	162	709
Other countries	765	200	149	250	75	118
Total	10,710	4,955	3,299	2,851	1,329	1,838
Cheese, Emmenthaler (Swiss): [3]						
Switzerland				[4] 934	13,571	11,211
Denmark				[4] 40	594	661
Germany				[4] 48	497	813
Other countries				[4] 120	1,110	883
Total				[4] 1,142	15,772	13,568
Cheese, other than Swiss: [5]						
Italy	36,572	31,332	38,337	36,958	39,307	30,296
France	4,923	5,874	6,243	6,035	3,860	4,333
Netherlands	3,687	3,736	3,525	2,915	2,334	2,435
Switzerland	20,638	16,449	19,731	16,452	3,607	1,463
Other Europe	6,634	5,983	6,052	8,469	1,994	3,145
Total Europe	72,454	63,374	73,888	70,829	41,102	41,672
Canada	16,609	11,439	9,381	5,895	818	1,366
Other countries	719	611	1,337	396	280	629
Total	89,782	75,424	84,606	77,120	42,200	43,667
Eggs in the shell:	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*
Hong Kong	219	199	236	250	263	248
China	6	40	28	15	19	20
Canada	54	13	13	60	15	13
Other countries	17	4	14	12	4	1
Total	296	256	291	337	301	282
Eggs and egg yolks (dried, frozen, and preserved):	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
China	14,825	5,409	20,582	18,206	7,918	2,745
United Kingdom	3,357	248	3,285	4,498	76	84
Other countries	133	244	593	253	62	79
Total	18,315	5,901	24,460	22,957	8,056	2,908
Egg albumen:						
China	6,907	2,836	3,431	4,868	2,208	1,654
Other countries	919	78	77	450	13	68
Total	7,826	2,914	3,508	5,318	2,221	1,722
Fibers, animal:						
Silk, raw, in skeins reeled from cocoon—						
Japan	59,934	64,673	63,415	61,243	67,309	69,423
China	11,872	9,816	12,326	12,717	10,432	5,258
Other countries	1,596	1,269	1,455	3,733	4,038	3,168
Total	73,402	75,758	77,196	77,693	81,779	77,849

[1] Preliminary.
[2] Less than 500.
[3] Included with "Cheese, other than Swiss" prior to June 18, 1930.
[4] June 18 to June 30.
[5] Includes "Swiss cheese" prior to June 18, 1930.

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
ANIMALS AND ANIMAL PRODUCTS—Con.						
Fibers, animal—Continued.						
Wool, unmanufactured—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Carpet wool—						
United Kingdom	51,602	32,423	33,861	23,326	14,085	9,159
France	5,371	5,414	4,470	4,280	1,814	1,078
China	36,362	55,998	53,589	36,931	33,603	18,720
British India	6,906	10,611	14,390	11,106	5,163	9,430
Argentina	9,513	8,924	19,820	24,405	25,567	20,428
Palestine and Syria	8,064	8,420	3,953	10,460	4,388	3,970
Iraq	4,115	6,550	6,349	7,481	4,210	6,037
Egypt	1,650	2,191	3,765	3,714	2,351	2,022
Germany	2,876	2,814	3,280	3,250	2,622	1,828
Irish Free State	1,729	1,580	2,134	2,126	490	1,427
Italy	4,532	4,056	3,668	3,053	2,772	2,627
Switzerland	2,132	1,515	1,509	1,506	1,173	1,002
Other countries	9,646	4,793	13,945	9,493	5,023	3,731
Total	144,698	148,489	164,713	141,111	103,201	81,460
Clothing wool—						
United Kingdom	4,775	4,169	2,499	1,807	1,800	1,084
Australia	3,797	5,515	5,986	5,690	2,871	3,489
Canada	2,353	2,838	1,601	1,129	312	75
Argentina	2,843	2,545	1,872	2,300	354	96
Chile	1,186	1,677	1,625	1,094	861	1
New Zealand	662	1,670	2,081	3,514	360	1,411
Uruguay	497	213	1,062	1,275	143	23
Other countries	657	747	1,732	2,047	352	1,032
Total	18,770	19,374	18,408	18,856	6,559	7,211
Combing wool—						
United Kingdom	15,484	17,344	12,319	8,784	2,933	2,114
Australia	38,714	21,992	17,906	14,911	22,018	9,636
Argentina	15,265	11,424	12,875	10,674	1,898	193
New Zealand	5,192	8,260	8,577	3,093	2,065	413
Uruguay	17,751	6,962	20,341	11,815	4,553	583
Union of South Africa	4,488	4,566	2,913	926	2,715	1,172
Canada	3,599	6,122	5,314	5,057	396	926
Other countries	2,415	3,612	3,233	3,215	2,150	93
Total	102,908	80,282	83,478	58,474	38,728	15,130
Hair of the Angora goat (mohair), alpaca—						
United Kingdom	792	541	384	391	360	60
Turkey (Europe and Asia)	3,237	983	2,034	553	9	0
British South Africa	2,505	660	884	370	407	0
Peru	82	425	716	622	149	50
China	74	184	145	48	26	27
Other countries	62	97	175	52	58	14
Total	6,752	2,890	4,338	2,036	999	141
Sausage casings:						
Germany	1,904	1,353	2,599	1,813	763	850
Argentina	4,804	4,975	5,719	5,459	3,897	3,373
Canada	3,351	3,928	2,989	2,218	1,808	2,199
Australia	2,198	2,213	2,597	3,024	1,838	1,457
China	2,074	1,640	1,445	1,256	918	655
New Zealand	901	1,223	1,086	1,470	798	1,087
Uruguay	876	917	1,317	1,527	736	497
Chile	464	260	859	648	404	522
Russia, Soviet (Europe)	633	665	961	1,300	496	500
Turkey (Asia and Europe)	213	235	268	224	353	251
Other countries	1,436	2,136	2,210	2,617	1,544	1,835
Total	18,844	19,545	22,040	21,556	13,355	13,228

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS						
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Cocoa or cacao beans:						
British West Africa	164, 338	133, 963	146, 739	145, 400	151, 524	131, 720
Brazil	81, 148	100, 262	87, 338	95, 516	75, 726	142, 284
Dominican Republic	51, 084	39, 591	50, 353	41, 120	37, 898	54, 412
British West Indies and Bermudas	31, 247	38, 217	41, 933	39, 276	41, 805	21, 240
Venezuela	13, 207	14, 482	18, 008	10, 302	17, 338	13, 936
Germany	15, 797	29, 074	17, 424	8, 565	11, 506	8, 347
Netherlands	13, 133	11, 502	6, 074	5, 528	9, 990	4, 289
United Kindgom	15, 644	9, 234	10, 612	12, 790	16, 429	12, 103
French Africa	220	0	44	8, 741	12, 308	7, 282
Ecuador	13, 710	19, 210	16, 939	14, 754	13, 170	11, 920
Panama	4, 899	3, 861	9, 148	7, 693	10, 080	13, 451
Other countries	20, 757	12, 147	14, 631	23, 253	17, 668	13, 869
Total	425, 184	411, 543	419, 243	421, 938	415, 442	434, 853
Coffee:						
Brazil	1, 000, 721	1, 059, 742	933, 056	1, 011, 430	1, 196, 881	1, 158, 566
Colombia	313, 590	261, 678	263, 236	351, 333	330, 379	334, 105
Central America	40, 070	64, 443	54, 774	56, 763	53, 276	31, 923
Venezuela	43, 436	53, 072	64, 621	55, 710	60, 378	45, 849
Other countries	47, 030	96, 457	119, 383	86, 822	87, 655	58, 398
Total	1, 444, 847	1, 535, 392	1, 435, 070	1, 562, 058	1, 728, 569	1, 628, 841
Fibers, vegetable:	*Bales* (6)	*Bales* (6)	*Bales* (6)	*Bales* (6)	*Bales* (6)	*Bales* (6)
Cotton, raw—						
Egypt	213, 975	197, 868	282, 442	181, 740	21, 688	66, 313
British India	19, 330	26, 081	53, 842	59, 200	34, 577	21, 865
Mexico	97, 384	24, 076	54, 402	40, 702	14, 238	21, 921
China	30, 408	67, 203	38, 816	46, 206	31, 135	9, 092
Peru	18, 097	19, 133	18, 066	19, 144	1, 623	3, 757
Other countries	20, 311	32, 689	28, 277	60, 517	3, 837	15, 746
Total	399, 505	367, 050	475, 845	413, 509	107, 098	138, 694
Flax, unmanufactured—	*Long tons*	*Long tons*	*Long tons*	*Long tons*	*Long tons*	*Long tons*
Latvia	898	1, 520	2, 176	2, 231	1, 926	1, 836
United Kingdom	1, 231	1, 800	1, 758	1, 768	383	487
Belgium	446	739	757	810	536	157
Netherlands	287	253	208	231	154	67
Russia, Soviet (Europe)	642	149	294	1, 127	155	62
Other Europe	790	726	283	695	275	1, 077
Total Europe	4, 294	5, 187	5, 476	6, 862	3, 429	3, 686
Canada	43	136	72	97	137	233
Other countries	366	124	102	54	32	0
Total	4, 705	5, 437	5, 650	7, 013	3, 598	3, 919
Manila fiber—						
Philippine Islands	60, 381	46, 967	59, 832	70, 813	42, 569	26, 532
Other countries	249	1, 051	472	2, 035	635	202
Total	60, 630	48, 018	60, 304	72, 848	43, 204	26, 734
Sisal and henequen—						
Mexico	82, 008	92, 534	95, 080	57, 098	38, 463	71, 428
Netherland East Indies	18, 870	16, 433	20, 037	30, 450	24, 754	14, 915
Cuba	2, 770	1, 849	2, 186	3, 402	4, 181	2, 065
Netherlands	238	1, 973	2, 216	3, 161	2, 595	5, 219
United Kingdom	297	234	1, 686	1, 583	7, 264	7, 922
Other countries	11, 968	11, 181	14, 146	16, 814	6, 675	7, 243
Total	116, 151	124, 204	135, 351	112, 508	83, 932	108, 792

[6] Bales of 478 pounds net.

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—*continued*						
Fruits:						
Dried—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Currants—						
Greece	12,714	10,800	9,178	9,050	8,594	6,652
Other Europe	199	56	108	13	0	0
Total Europe	12,913	10,856	9,286	9,063	8,594	6,652
Other countries	98	178	96	92	16	11
Total	13,011	11,034	9,382	10,055	8,610	6,663
Dates—						
Iraq	10,161	34,700	45,373	48,804	34,418	33,492
United Kingdom	3,413	6,987	3,085	1,350	5,544	6,652
Hejaz, Arabia, etc	32,828	694	476	703	990	153
Other countries	3,032	1,747	5,153	2,393	1,476	3,604
Total	49,434	44,128	54,087	53,250	42,428	43,901
Figs—						
Turkey (Asia and Europe)	22,270	16,506	22,418	12,784	9,998	6,249
Portugal	2,786	5,933	4,404	934	843	397
Greece	6,842	2,465	4,910	6,084	2,933	1,181
Italy	3,306	1,943	1,358	641	1,018	780
Other countries	4,301	4,552	2,473	1,474	33	88
Total	39,504	31,459	35,563	21,917	14,825	8,695
Fresh—	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*
Bananas—						
Central America	32,208	39,676	42,386	42,764	36,818	33,698
Jamaica	13,861	13,398	11,722	11,513	11,010	7,905
Cuba	2,905	2,730	3,467	4,149	3,502	3,163
Mexico	5,928	6,511	4,481	6,200	5,520	4,957
Colombia	2,073	1,695	1,439	1,171	909	1,970
Other countries	127	19	35	112	22	92
Total	57,102	64,029	63,530	65,909	57,841	51,785
Lemons—	*1,000 boxes* [7]	*1,000 boxes* [7]	*1,000 boxes* [7]	*1,000 boxes* [7]	*1,000 boxes* [7]	*1,000 boxes* [7]
Italy	654	1,300	382	1,217	342	159
Other Europe	5	4	8	10	8	17
Total Europe	659	1,304	390	1,227	350	176
Other countries	0	4	1	2	0	(2)
Total	659	1,308	391	1,229	350	176
Olives, in brine—	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*
Spain	4,664	5,739	6,209	7,746	6,649	6,003
Greece	96	144	204	308	625	666
Other Europe	425	532	496	357	144	367
Total Europe	5,185	6,415	6,909	8,411	7,418	7,036
Other countries	27	43	46	41	11	21
Total	5,212	6,458	6,955	8,452	7,429	7,057
Grains, flours, etc.:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Rice, cleaned (excluding patna)—						
Hong Kong	19,741	20,786	17,934	15,094	15,878	11,011
British India	465	1,061	2,380	243	1,059	724
Mexico	8,002	1,264	1,022	1,259	2,700	1,608
Italy	3,695	3,971	1,032	1,310	1,391	1,072
Netherlands	5,837	2,139	271	1,622	2,419	1,233
Germany	3,768	1,077	396	489	2,367	468
Siam	2,912	448	1	0	0	0
Other countries	9,668	2,928	2,130	929	812	1,041
Total	54,088	33,674	25,166	20,946	26,626	17,157

[2] Less than 500.
[7] Boxes of 74 pounds net.

163060°—33——44

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Grains, flours, etc.—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Rice, patna—						
Netherlands	[8] 1,215	1,826	2,329	2,010	2,051	1,035
Other countries	[8] 6	0	0	166	65	52
Total	[8] 1,221	1,826	2,329	2,176	2,116	1,087
Rice, uncleaned—						
Mexico	7,802	3,036	5,904	4,181	0	0
Japan	3,213	2,316	1,441	1,492	5,011	1,468
British India	224	428	325	694	419	55
British Guiana	0	40	66	423	656	106
Other countries	489	176	324	215	76	55
Total	11,728	5,996	8,060	7,005	6,162	1,684
Rice, flour, and meal—						
Mexico	2,307	1,981	508	340	0	0
Japan	469	442	504	472	426	352
China	36	38	68	51	24	36
Hong Kong	96	100	62	86	60	123
France	3	3	5	7	30	26
Other countries	61	42	92	129	63	19
Total	2,972	2,606	1,239	1,085	603	556
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Wheat—						
Canada	13,234	15,706	21,429	12,948	19,053	12,885
Other countries	1	0	1	0	1	(²)
Total	13,235	15,706	21,430	12,948	19,054	12,885
Wheat flour—	*Barrels*	*Barrels*	*Barrels*	*Barrels*	*Barrels*	*Barrels*
Canada	5,344	3,474	2,273	889	630	145
United Kingdom	474	49	45	651	363	43
Other countries	238	2,206	285	163	169	84
Total	6,056	5,729	2,603	1,703	1,162	272
Nuts:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Almonds, shelled—						
Spain	8,389	9,637	10,399	8,902	6,432	4,830
Italy	6,076	7,703	6,578	8,912	6,348	3,287
France	541	306	286	136	223	163
Other Europe	165	197	273	118	61	5
Total Europe	15,171	17,843	17,536	18,068	13,064	8,285
Other countries	528	414	570	236	177	51
Total	15,699	18,257	18,106	18,304	13,241	8,336
Almonds, not shelled—						
Spain	158	229	1,068	4,530	3	1
France	154	131	474	518	54	0
Italy	180	98	73	375	18	7
Other Europe	7	5	267	61	0	0
Total Europe	499	463	1,882	5,484	75	8
Other countries	139	1	9	19	3	1
Total	638	464	1,891	5,503	78	9

[8] January–June.

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—*continued.*						
Nuts—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Filberts, shelled—						
France	1,014	1,200	1,027	178	334	91
Germany	277	22	175	40	334	0
Italy	732	348	746	752	345	335
Spain	421	329	1,764	2,888	37	428
Other Europe	281	77	63	25	110	74
Total Europe	2,725	1,982	3,775	3,892	1,168	928
Turkey (Asia and Europe)	2,133	4,618	1,800	609	3,417	1,422
Other countries	92	0	31	2	11	0
Total	4,950	6,600	5,606	4,503	4,596	2,350
Filberts, not shelled—						
Italy	9,296	6,687	11,053	4,548	3,987	6,293
Spain	49	1,936	818	954	423	73
Other Europe	291	1,334	243	254	229	11
Total Europe	9,636	9,957	12,114	5,756	4,639	6,377
Turkey (Asia and Europe)	54	1,265	20	0	820	0
Other countries	132	22	0	0	200	0
Total	9,822	11,244	12,134	5,756	5,659	6,377
Peanuts, shelled—						
China	44,729	49,986	23,987	7,140	4,989	341
Philippine Islands	0	0	0	351	1,075	382
Other countries	2,123	4,798	2,619	861	441	47
Total	46,852	54,784	26,606	8,352	6,505	770
Peanuts, not shelled—						
China	3,812	12,339	4,680	2,445	3,483	724
Japan	245	509	360	212	343	156
Kwantung	0	100	200	110	7	80
Other countries	353	550	469	143	450	189
Total	4,410	13,498	5,709	2,910	4,283	1,149
Walnuts, shelled—						
France	8,995	12,551	9,308	11,357	4,079	5,094
Other Europe	3,007	989	2,033	722	2,090	1,245
Total Europe	12,002	13,540	11,341	12,079	6,769	6,339
China	8,144	1,952	5,052	4,304	8,216	4,129
Other countries	833	523	1,563	835	1,341	263
Total	20,979	16,015	17,956	17,278	16,326	10,731
Walnuts, not shelled—						
Italy	12,062	4,558	4,501	4,620	2,356	4,099
France	3,556	2,244	2,720	831	477	1,201
Other Europe	3,004	144	3,336	117	99	68
Total Europe	18,652	6,946	10,557	5,568	2,932	5,368
China	5,870	2,531	4,575	1,419	504	81
Other countries	1,184	837	449	37	116	53
Total	25,706	10,314	15,581	7,024	3,552	5,502
Oils, vegetable:						
Coconut oil, product of Philippine Islands	286,776	273,309	377,288	370,600	315,942	297,083
Olive oil, edible—						
Italy	58,706	45,145	62,202	71,265	45,661	47,116
Spain	21,682	17,797	16,910	20,909	23,675	27,823
France	4,705	5,335	6,182	2,959	2,335	2,395
Other Europe	1,300	954	1,527	710	542	204
Total Europe	86,393	69,231	86,821	95,843	72,213	77,538
Other countries	1,529	899	1,297	2,603	1,581	1,151
Total	87,922	70,130	88,118	98,446	73,794	78,689

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Oils, vegetable—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Olive oil, inedible—						
Italy	32, 124	29, 244	35, 889	33, 992	27, 364	28, 831
Spain	10, 882	12, 333	9, 575	16, 518	13, 987	20, 352
Greece	2, 206	2, 783	6, 856	346	2, 579	3, 030
Portugal	783	1, 675	2, 122	425	1, 038	1, 445
Other Europe	576	525	325	1, 817	25	741
Total Europe	46, 571	46, 560	54, 767	53, 098	44, 993	54, 399
Algeria and Tunisia	206	1, 296	4, 103	6, 877	6, 753	4, 110
Other countries	30	107	807	198	666	358
Total	46, 807	47, 963	59, 677	60, 173	52, 412	58, 867
Soybean oil—						
Kwantung	15, 759	13, 546	11, 089	12, 867	5, 769	2, 358
China	1, 803	891	1, 520	0	0	723
Japan	4, 033	41	1, 729	121	1	([2])
Other countries	1, 958	84	2, 834	344	145	4
Total	23, 553	14, 562	17, 172	13, 332	5, 915	3, 085
Oilseeds:						
Copra, not prepared—						
Philippine Islands	330, 946	336, 920	386, 567	299, 193	311, 781	229, 348
British Malaya	59, 746	40, 381	84, 700	42, 114	57, 619	64, 660
Australia	37	17, 445	55, 988	35, 455	30, 077	13, 096
British Oceania	19, 131	19, 941	37, 685	43, 778	48, 774	25, 861
French Oceania	29, 188	25, 273	21, 306	22, 662	21, 482	12, 791
Netherlands East Indies	10, 579	5, 867	27, 144	29, 206	76, 495	88, 309
New Zealand	0	76	4, 281	17, 325	13, 838	5, 475
Other countries	4, 919	10, 255	12, 266	3, 723	5, 331	6, 203
Total	454, 546	456, 158	629, 937	493, 456	565, 397	445, 741
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Flaxseed—						
Argentina	20, 581	16, 057	20, 927	19, 236	6, 102	13, 342
Canada	3, 429	1, 933	2, 528	355	1, 490	506
Other countries	214	122	39	61	221	2
Total	24, 224	18, 112	23, 494	19, 652	7, 813	13, 850
Seeds, except oilseeds:						
Clover seed—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Clover, red—						
Poland and Danzig	0	2, 015	1, 278	1, 141	0	0
France	10, 173	493	3, 664	845	2, 249	0
Germany	251	697	679	283	0	0
Russia, Soviet (Europe)	0	1, 328	202	88	0	0
Other Europe	278	855	1, 578	0	0	0
Total Europe	10, 702	5, 388	7, 401	2, 357	2, 249	0
Other countries	310	46	151	0	0	30
Total	11, 012	5, 434	7, 552	2, 357	2, 249	30
All other, including alsike and crimson—						
France	1, 561	791	2, 750	589	1, 450	55
Germany	455	799	1, 651	2, 149	686	982
Poland and Danzig	390	964	957	963	330	286
Hungary	694	485	372	1, 546	1, 510	1, 293
Other Europe	481	221	303	286	129	110
Total Europe	3, 581	3, 260	6, 033	5, 533	4, 105	2, 726
Canada	10, 745	13, 121	8, 899	7, 515	95	([2])
Other countries	7	16	12	0	8	13
Total	14, 333	16, 397	14, 944	13, 048	4, 208	2, 739

[2] Less than 500.

TABLE 440.—*Principal agricultural products imported into the United States, by countries, 1926–27 to 1931–32*—Continued

Article and country from which imported	Year beginning July					
	1926–27	1927–28	1928–29	1929–30	1930–31	1931–32
VEGETABLE PRODUCTS—continued						
Spices:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Pepper, unground—						
Netherland East Indies	6,636	6,446	9,205	17,250	19,351	23,431
British India	11,048	7,907	6,218	7,505	6,995	4,754
United Kingdom	3,577	5,292	3,435	3,238	1,409	1,554
British Malaya	2,287	2,831	1,469	870	1,409	2,770
French Indo-China	280	44	2	261	1,964	538
Other countries	1,389	1,458	5,334	1,864	81	141
Total	25,217	23,978	25,663	30,988	31,299	33,188
Sugar, raw, cane:	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Cuba	3,953,360	3,399,294	4,108,503	2,769,371	2,404,979	2,350,218
Philippine Islands	427,747	612,859	604,695	808,878	859,467	874,374
Virgin Islands	4,072	8,617	7,983	4,837	3,578	4,075
Other countries	35,245	23,791	31,121	58,002	19,197	33,575
Total	4,420,424	4,044,561	4,752,302	3,641,088	3,287,221	3,262,242
Tea:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Japan	28,430	25,399	27,329	22,048	21,416	22,927
United Kingdom	22,136	20,380	23,608	21,578	23,310	23,340
Ceylon	16,578	16,329	16,893	19,047	16,895	16,855
China	11,655	10,131	8,878	7,405	6,704	7,329
British India	8,059	9,196	7,088	9,217	10,612	9,886
Netherland East Indies	7,660	5,398	6,358	4,891	5,184	6,637
Other countries	2,884	3,267	2,881	2,182	3,027	3,485
Total	97,402	90,099	92,635	86,368	87,148	90,450
Tobacco, leaf, unmanufactured:						
Leaf, product of Philippine Islands	1,117	2,541	4,078	4,007	4,278	4,207
Leaf, for cigar wrappers—						
Netherlands	6,358	6,218	6,095	8,415	2,988	3,365
Other countries	115	126	117	126	51	52
Total	6,473	6,344	6,212	8,541	3,039	3,417
All other leaf—						
Cuba	24,233	21,530	22,116	21,773	18,299	13,048
Greece	28,383	15,694	16,741	13,400	18,913	19,467
Turkey (Asia and Europe)	15,355	17,289	14,269	6,162	12,974	13,293
Italy	13,708	13,743	11,286	6,563	12,124	13,931
Germany	973	1,242	305	391	71	175
Other countries	847	729	1,284	87	284	728
Total	83,499	70,227	66,001	48,376	62,665	60,042
India rubber, crude:						
British Malaya	602,756	524,834	811,843	788,594	733,419	659,029
Netherland East Indies	156,772	170,161	215,863	195,297	164,690	157,966
Ceylon	89,874	73,542	112,257	118,425	86,985	79,522
United Kingdom	55,155	110,575	50,938	7,249	27,970	65,715
Other countries	57,910	46,928	36,028	27,841	19,134	21,408
Total	962,467	926,040	1,226,929	1,137,406	1,032,198	1,083,640

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, January and June issues, 1927–1932, and official records of the Bureau of Foreign and Domestic Commerce.

TABLE 441.—*Vegetable oils: Exports from the United States, 1909–10 to 1931–32*

Year beginning July—	Corn	Cotton-seed	Linseed	Cocoa butter or butterine	Coconut	Peanut	Soybean
	1,000 pounds	*1,000 pounds*	*1,000 gallons*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1909–10	11, 299	223, 955	228				
1910–11	25, 371	225, 521	175				
1911–12	23, 866	399, 471	247				
1912–13	19, 839	315, 233	1, 734				
1913–14	18, 282	192, 963	239				
1914–15	17, 790	318, 367	1, 212				
1915–16	8, 968	266, 512	714				
1916–17	8, 780	158, 912	1, 202				
1917–18	1, 831	100, 780	1, 188				
1918–19	1, 095	178, 700	1, 096				
1919–20	12, 483	159, 400	1, 136	11, 048	141, 088	4, 922	67, 782
1920–21	6, 919	283, 268	561	3, 171	6, 639	1, 595	5, 118
1921–22	5, 280	91, 615	366	1, 856	10, 185	1, 802	537
1922–23	5, 224	64, 292	414	957	12, 993	188	2, 495
1923–24	4, 196	39, 418	350	888	19, 423	168	2, 892
1924–25	3, 586	53, 261	320	1, 577	17, 890	(1)	579
1925–26	2, 927	59, 015	311	1, 766	15, 444	(1)	623
1926–27	405	57, 580	365	290	19, 826	(1)	3, 104
1927–28	329	61, 470	296	1, 897	22, 358	(1)	7, 514
1928–29	323	29, 531	289	1, 010	24, 556	(1)	8, 241
1929–30	363	31, 998	284	347	30, 225	(1)	5, 509
1930–31	915	26, 353	173	463	19, 963	(1)	4, 410
1931–32 [2]	774	41, 038	110	320	22, 083	(1)	3, 649

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1910–1918; Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1932

[1] Included with "Other vegetable oils and fats."
[2] Preliminary.

TABLE 442.—*Vegetable oils: Imports into the United States, 1909–10 to 1931–32*

Year beginning July	Castor [1]	Tung	Cocoa butter or butterine	Coconut	Cottonseed [1]	Linseed	Olive	Palm	Palm kernel	Peanut	Perilla [2]	Rapeseed	Soybean
	1,000 gals.	*1,000 gals.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 gals.*	*1,000 gals.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 gals.*	*1,000 lbs.*	*1,000 gals.*	*1,000 lbs.*
1909–10	7	[3] 5, 760	3, 370	48, 346	(4)	(4)	4, 545	92, 772	(4)	(5)		[6] 1, 083	(4)
1910–11	7	[3] 7, 042	4, 279	51, 118	(4)	(4)	4, 984	57, 100	(4)	(5)		[6] 1, 363	(4)
1911–12	8	4, 768	6, 075	46, 371	1, 513	737	5, 473	47, 159	25, 393	896		1, 183	28, 021
1912–13	5	5, 997	3, 603	50, 504	3, 384	174	5, 840	50, 229	23, 569	1, 196		1, 550	12, 340
1913–14	189	4, 932	2, 839	74, 386	17, 293	192	6, 981	68, 040	34, 328	1, 337		1, 464	16, 360
1914–15	63	4, 940	150	63, 135	15, 162	535	7, 364	31, 486	4, 906	853	69	1, 499	19, 207
1915–16	253	4. 968	400	66, 008	17, 181	50	8, 109	40, 497	6, 761	1, 475	66	2, 561	98, 120
1916–17	324	6, 864	166	79, 223	13, 703	111	8, 184	36, 074	1, 857	3, 026	443	1, 085	162, 690
1917–18	1, 175	4, 816	(7)	259, 195	14, 291	51	2, 652	27, 405	19	8, 289	1, 016	3, 056	336, 825
1918–19	472	6, 217	3	344, 728	20, 410	990	4, 398	19, 281	1, 945	11, 393		2, 091	236, 805
1919–20	271	10, 614	42	271, 540	24, 165	4, 550	7, 029	50, 165	54	22, 064		1, 230	195, 774
1920–21	99	4, 440	915	173, 889	1, 315	1, 997	4, 705	31, 076	2, 769	2, 422		1, 172	49, 331
1921–22	46	7, 410	7, 123	230, 236	(7)	22, 494	11, 112	39, 159		384		1, 352	8, 283
1922–23	185	11, 919	3, 010	212, 573	45	7, 568	15, 635	118, 816		1, 007		1, 770	38, 635
1923–24	36	10, 786	1, 169	181, 230	(7)	2, 379	15, 121	86, 784	1, 126	2, 008		2, 068	17, 631
1924–25	41	12, 626	733	250, 121	0	3, 145	15, 743	114, 387	37, 864	468		1, 959	20, 434
1925–26	66	11, 315	14	200, 878	283	2, 231	18, 368	152, 254	85, 074	450		2, 088	17, 401
1926–27	22	13, 657	256	286, 776	6, 396	177	17, 964	110, 184	14, 760	1, 061		2, 731	23, 553
1927–28	125	11, 150	18	273, 309	1	-46	15, 746	183, 977	56, 021	648	2, 289	2, 604	14, 562
1928–29	17	15, 365	17	377, 288	(7)	890	19, 706	228, 230	80, 514	454	5, 791	2, 543	17, 172
1929–30	16	17, 459	270	370, 600	2	722	21, 149	237, 860	41, 380	262	9, 204	2, 152	13, 333
1930–31	17	13, 254	15	315, 942	1	34	16, 827	313, 940	17, 197	2, 822	9, 652	1, 930	5, 915
1931–32 [8]	102	10, 846	12	297, 083	0	4	18, 341	221, 155	9, 313	1, 243	12, 436	1, 152	3, 085

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States 1910–1918: Monthly Summary of Foreign Commerce of the United States, June issues, 1919–1932.

[1] Imports for consumption. (See introduction to Agricultural Statistics.)
[2] Not separately reported prior to 1914–15; 1914–15 to 1917–18 and 1927–28 are imports for consumption; 1918–19 to 1926–27 not available; 1928–29 to 1931–32 are general imports.
[3] Includes peanut oil.
[4] Included in all other fixed or expressed.
[5] Included in Tung oil.
[6] Includes hempseed.
[7] Less than 500 pounds.
[8] Preliminary.

TABLE 443.—*Oil cake and oil-cake meal: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States	1,394,589	196,587	1,186,934	250,786	1,278,525	334,172	511,392	134,148	910,992	66,606
Russia	672,830	0	322,756	0	651,036	0	613,472	0	714,820	0
British India	584,664	246	699,241	320	705,990	229	530,085	177	612,566	78
Egypt	356,706	3	347,802	0	391,092	0	503,541	0	416,278	0
France	336,094	75,294	438,107	75,411	360,341	102,373	553,794	90,974	461,485	170,810
China	270,571	0	287,111	0	291,910	0	300,908	0	274,466	0
Italy	242,957	603	324,047	230	303,662	436	134,412	3,497	259,072	991
Rumania	[2] 143,461	[2] 9					207,129			
Argentina	139,227	0	144,049	0	146,339	0	144,238	0	199,530	0
Dutch East Indies	135,473	0	171,581	0	182,958	0	141,686	0	[3] 155,031	0
Peru	70,465	0	79,042	0	66,540	0	78,715	0	79,112	0
Brazil	54,650	0	44,407	0	58,633	0	57,387	0	76,364	0
Canada	45,464	15,863	44,419	13,930	51,032	21,931	35,907	16,559	29,817	9,202
Bulgaria	37,520	10	46,972	0	55,701	30	77,575		77,415	
Spain	28,109	3,754	13,898	5,116	10,853	7,545	5,135	12,572	5,096	18,120
British Malaya	14,301	11,530	18,079	15,770	17,183	16,858	12,311	11,933	13,512	11,487
Chile	7,725	1	3,780	0	5,640	0	5,077	0		0
Australia [4]	6,921	2,404	5,711	6,261	10,209	938	7,567	1,008	12,088	262
Latvia	4,355	0	2,489	0	3,058	0	11,665	0		0
Total	4,546,172	306,304	4,180,425	367,824	4,590,702	484,512	3,931,996	270,928	4,297,644	277,496

[1] Preliminary.
[2] 3-year average.
[3] Java and Madura only
[4] Year ended June 30.

TABLE 443.—*Oil cake and oil-cake meal: International trade, average 1925–1929, annual 1928–1931*—Continued

Country	Calendar year									
	Average, 1925–1929		1928		1929		1930		1931	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL IMPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Denmark	26,788	1,558,619	30,050	1,432,965	31,326	1,612,452	35,644	1,451,361	1,547,206	40,536
Germany	768,849	1,064,314	972,716	1,205,083	620,202	1,163,887	594,523	980,524	440,686	1,129,406
United Kingdom	167,379	1,001,966	208,134	809,899	160,247	993,657	134,227	975,034	162,570	980,569
Netherlands	120,322	680,263	120,920	669,165	133,907	835,947	141,231	487,119	171,637	536,139
Japan	43,218	346,986	58,424	353,768	78,254	316,816	23,276	321,335	26,577	322,589
Belgium	83,170	324,675	95,929	334,711	99,818	337,629	81,220	393,842	123,707	459,424
Sweden	12,655	305,454	9,416	311,856	18,261	290,655	28,194	307,963	23,704	393,639
Finland	0	183,687	0	227,575	0	163,685	0	134,067	0	121,555
Irish Free State	0	111,617	0	106,412	0	108,652	0	110,229	0	6,350
Czechoslovakia	54,113	76,079	46,186	106,306	59,654	97,314	97,404	99,772	68,587	136,533
Switzerland	13,977	75,127	17,734	75,052	12,844	69,505	16,937	57,948	22,733	60,246
Norway	984	63,263	1	63,481	4,730	33,812	1,245	49,556	----------	99,178
Poland	28,545	56,356	27,397	84,824	35,855	69,690	33,685	45,529	35,037	26,069
Ceylon	25,252	42,690	32,650	42,636	37,344	40,195	31,234	35,307	41,511	29,670
Austria	1,411	31,822	899	46,513	1,628	41,111	1,002	38,518	926	46,482
Hungary	15,310	16,411	12,043	20,801	24,675	27,115	21,081	27,534	18,617	36,742
Total	1,361,973	5,939,319	1,632,499	5,899,047	1,318,775	6,202,122	1,240,903	5,515,638	2,683,498	4,425,130

Bureau of Agricultural Economics. Official sources except as otherwise noted. The class called here "Oil cake and oil-cake meal" includes the edible cake and meal remaining after making oil from such products as cottonseed, flaxseed, peanuts, corn, etc. Soybean cake is not included in this table.

TABLE 444.—*Rubber: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
British Malaya	931,522	362,113	1,300,117	362,011	1,247,342	304,331	1,162,535	280,972
Dutch East Indies	593,755	0	664,555	0	616,332	0	653,125	0
Ceylon	133,621	11,137	180,632	13,377	170,946	11,155	138,605	6,991
Brazil	46,638	0	39,643	0	28,689	0	23,096	0
British India	23,532	100	26,250	271	24,153	260	18,979	309
Indo-China	20,509	[2] 29	22,720	[2] 60	23,046	108	----------	----------
British North Borneo	14,419	0	16,534	0	15,937	0	----------	0
Mexico	8,440	566	3,261	1,139	2,688	6	----------	----------
Bolivia	7,474	[3] 1	6,818	----------	----------	----------	----------	----------
Nigeria	3,947	0	4,422	0	4,877	0	----------	0
Kamerun [2]	3,818	1	4,420	0	3,601	----------	----------	0
French Equatorial Africa	3,242	[2] 211	[2] 2,305	[2] 213	1,578	122	----------	----------
Belgian Congo	2,230	1	1,872	0	1,128	0	550	0
French Guinea	2,046	[2] 30	[2] 830	[2] 4	[2] 571	----------	----------	----------
Switzerland	1,939	1,155	2,624	1,466	2,566	1,813	2,104	1,893
Ecuador	1,756	0	409	0	318	0	----------	0
Gold Coast	889	0	649	0	540	0	221	0
Peru	526	0	543	0	284	0	81	0
Angola	179	0	29	0	13	0	----------	0
Total	1,800,482	375,344	2,278,708	378,541	2,142,607	317,795	1,998,696	290,225
PRINCIPAL IMPORTING COUNTRIES								
United States	0	1,002,031	0	1,262,939	0	1,089,830	0	1,124,003
United Kingdom	0	124,052	0	275,088	0	268,806	0	190,818
France	16,049	106,453	7,478	140,400	5,685	159,147	2,751	119,438
Germany	6,051	87,825	7,119	117,054	11,469	113,365	11,551	99,330
Canada	0	59,580	0	79,512	0	64,492	0	56,583
Japan	0	50,307	0	76,922	0	73,710	0	97,548
Italy	351	27,855	81	36,700	149	41,735	24	22,639
Russia	0	23,145	0	28,278	0	36,173	0	62,192
Belgium	2,719	16,271	3,856	25,178	3,232	27,470	5,038	29,697
Spain	19	13,958	52	22,077	28	27,699	50	15,834
Netherlands	6,267	10,561	6,525	13,726	4,737	11,288	4,445	9,440
Austria	1,283	7,269	2,066	9,955	2,322	7,739	2,107	8,778
Sweden	144	5,420	107	8,527	102	10,097	66	8,736
Czechoslovakia	276	5,348	531	10,948	414	10,564	----------	----------
Hungary	213	2,391	227	3,316	134	3,216	185	3,170
Denmark	4	1,341	1	1,780	2	2,551	2,136	0
China	0	1,016	0	2,557	0	1,391	0	6,774
Total	33,376	1,544,723	28,043	2,114,957	28,274	1,949,273	28,353	1,854,980

Bureau of Agricultural Economics. Official sources except where otherwise noted. Figures for rubber include "India rubber," so-called, caoutchouc, caucho, jebe (Peru), hule (Mexico), borracha, massaranduba mangabeira, manicoba, sorva, and seringa (Brazil), gamelastiek (Dutch East Indies), caura, ser namhi (Venezuela).

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] 2-year average.

TABLE 445.—*Coffee: International trade, average 1925–1929, annual 1929–1931*

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Brazil	1,865,392	0	1,889,032	0	2,022,302	0	2,361,317	0
Colombia	324,198	[2] 5	375,114	13	419,714	9,096		
Dutch East Indies	187,523	3,035	180,368	2,247	135,614	2,169	151,634	5,012
Venezuela	118,217	0	141,907	0	103,942	27	123,550	0
Guatemala	100,915	0	[2] 97,394	0	125,673	0		
Salvador	96,466	0	103,137	0	129,237	0		
Haiti	72,395	0	62,956	0	73,432	0	57,960	0
Mexico	58,789	422	66,746	18	67,681	202	60,210	175
Costa Rica	38,946	0	43,393	0	51,889	0		
Nicaragua	30,645	0	29,207	0	33,736	99	34,934	118
British India	22,540	4,662	11,567	6,417	4,833	34,894	21,019	1,941
Dominican Republic	9,311	0	12,142	0	10,686	0		0
Jamaica	8,729	0	6,572	0	6,875	0	9,177	0
Total	2,934,066	8,124	3,019,535	8,695	3,185,614	46,487	2,819,801	7,246
PRINCIPAL IMPORTING COUNTRIES								
United States	17,669	1,429,825	6,726	1,482,258	8,727	1,599,317	7,211	1,741,536
France	219	360,039	141	374,869	160	394,396	66	426,438
Germany	365	266,650	539	327,010	822	340,310	2,195	345,082
Netherlands	36,978	113,722	24,494	98,597	21,410	100,918	14,895	103,515
Italy	4	99,761	1	103,325	6	99,863	23	96,667
Sweden	25	90,654	18	90,349	87	99,198	119	116,616
Belgium	890	88,285	1,541	86,801	1,308	105,037	10,233	134,918
Denmark	564	53,588	704	55,758	743	60,369	716	66,383
Argentina	0	51,666	0	54,663	0	56,083	0	50,555
Spain	4	48,120	11	52,666	0	58,325	0	48,875
United Kingdom	235	40,698	265	46,050	222	41,928	204	39,387
Finland	0	36,922	0	39,402	0	48,746	0	30,952
Norway [3]	0	35,572	0	33,996	0	37,686	0	40,199
Czechoslovakia	3	29,068	1	29,885	24	30,289	0	33,442
Union of South Africa	13	28,306	19	28,538	13	28,951	13	31,694
Switzerland	201	27,926	297	29,516	424	30,423	720	34,150
Canada	57	25,811	84	28,468	66	31,181	44	32,917
Algeria	59	21,971	3	26,396		27,871		30,448
Yugoslavia	5	21,180	1	21,466	0	20,154	0	19,671
Egypt	11	19,953	10	21,012	0	21,488	0	16,626
Cuba	1	19,382	2	18,528	23	12,200		
Austria	6	18,368	6	20,693	6	19,842	5	21,111
British Malaya	9,010	17,046	5,555	14,219	5,023	14,099	5,210	12,169
Poland	6	15,819	16	17,854	7	17,379	6	17,986
Chile	21	14,385	60	11,109	57	11,653	0	10,606
Greece	0	11,544	0	12,186	0	12,870	0	14,459
Hungary	0	7,459	0	8,002	0	7,667	4	7,231
Ceylon	8	2,858	[2] 14	3,344	13	2,784		4,214
Bulgaria	0	1,874	0	1,687	0	1,565	0	
Total	66,354	2,998,452	40,517	3,138,647	39,141	3,332,592	41,664	3,527,847

Bureau of Agricultural Economics. Official sources except where otherwise noted. The item coffee comprises unhulled and hulled, ground or otherwise prepared, but imitation or "surrogate" coffee and chicory are excluded.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Includes a small amount of surrogate.

TABLE 446.—*Tea: International trade, average 1925–1929, annual 1928–1931*

Country	Calendar year: Average 1925–1929, Exports	Average 1925–1929, Imports	1928, Exports	1928, Imports	1929, Exports	1929, Imports	1930, Exports	1930, Imports	1931 [1], Exports	1931 [1], Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
British India	364,848	8,260	364,686	10,164	388,493	8,462	365,344	8,660	343,073	7,597
Ceylon	228,445	1	236,719	1	251,490	[2] 1	243,021	1	243,970	-------
Dutch East Indies	124,947	8,434	135,058	9,339	139,930	9,123	137,573	8,472	[3] 127,081	[2] 6,405
China	116,300	8,214	123,150	13,030	125,695	5,010	91,358	3,028	92,591	4,421
Japan	24,631	1,009	24,004	1,028	23,660	1,244	20,316	1,152	25,410	122,604
Formosa	20,431	66	18,893	71	17,667	92	17,619	86	17,389	95
Total	879,602	25,984	902,510	33,633	946,935	23,932	875,231	21,399	849,514	141,182
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	0	429,507	0	418,831	0	464,145	0	452,763	0	445,505
United States	0	93,052	0	89,824	0	89,373	0	84,926	0	86,733
Australia [2]	0	49,242	0	49,076	0	50,576	0	50,028	-------	-------
Russia	0	43,287	0	64,590	0	63,029	0	53,411	0	45,653
Canada	0	38,268	0	39,527	0	38,677	0	50,880	0	33,115
Netherlands	29	20,144	26	28,186	40	28,716	93	29,587	119	31,214
Irish Free State	0	23,220	0	22,649	0	23,580	0	23,779	0	24,908
Persia [4]	742	14,925	161	15,662	506	16,280	131	14,475	-------	-------
Morocco	0	12,770	0	12,524	0	16,788	0	12,688	0	13,835
New Zealand	0	11,159	0	11,149	0	12,061	0	10,178	0	12,115
Union of South Africa	218	11,122	239	11,585	261	12,095	83	12,332	101	14,168
Germany	0	11,037	0	11,786	0	12,723	-------	13,320	0	11,672
Egypt	259	10,814	291	14,318	248	13,093	[5] 97	[5] 12,199	20	15,433
British Malaya	1,323	10,491	1,326	9,973	1,217	11,378	1,217	11,378	925	9,694
Chile	4	5,156	5	5,767	8	5,700	8	4,851		5,060
Indo-China	2,164	4,827	2,065	5,098	2,231	4,312	1,206	3,408	-------	-------
Poland	15	4,428	0	5,025	73	4,839	7	4,533	9	4,477
Argentina	0	3,867	0	4,211	0	4,213	0	3,874	0	3,950
France	81	3,456	57	3,352	69	3,494	38	3,278	40	3,556
Algeria	16	2,140	39	2,513	13	2,650	-------	2,646	-------	2,954
Czechoslovakia	3	1,492	1	1,597	1	1,606	0	1,364	0	1,808
Denmark	0	1,276	0	1,340	0	1,267	0	1,218	0	1,359
Austria	0	1,236	1	1,360	2	1,430	2	1,150	2	1,344
Yugoslavia	0	869	0	902	0	913	2	647	0	620
Hungary	5	777	0	902	0	836	0	585	0	638
Total	4,859	814,562	4,211	831,747	4,669	883,774	2,884	859,504	1,216	760,901

Bureau of Agricultural Economics. Official sources except where otherwise noted. These figures are for tea leaves only; tea dust and sweepings and yerbe mate are not included.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Java and Madura only.
[4] Year ending Mar. 20 of following year.
[5] Includes yerbe mate and imitation tea.

TABLE 447.—*Copra and coconut oil: International trade, average 1925–1929, annual 1929–1931*

COPRA

Country	Calendar year							
	Average, 1925–1929		1929		1930		1931 [1]	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Dutch East Indies	851, 367	6	1, 007, 214	22	828, 307	409	794, 034	323
Philippine Islands	409, 191	1, 017	382, 658	1, 975	384, 263	964	384, 128	710
British Malaya	386, 704	169, 135	444, 949	192, 506	429, 417	200, 198	420, 750	194, 938
Ceylon	239, 555	502	228, 759	[2] 656	203, 011	[2] 335	210, 258	----------
Fiji	62, 601	0	74, 426	0	53, 496	0	37, 894	0
Solomon Islands [2]	48, 372	0	47, 678	0	53, 045	0	----------	0
Mozambique	40, 469	0	44, 124	0	47, 062	0	48, 395	0
Zanzibar	36, 278	11, 050	37, 416	11, 367	28, 668	10, 926	26, 363	115
Tonga	32, 048	0	37, 769	0	31, 660	0	----------	0
Samoa, West	30, 179	0	28, 990	0	27, 518	0	----------	0
Tanganyika	17, 085	0	17, 741	0	16, 565	0	16, 204	0
Trinidad and Tobago	16, 331	1, 193	23, 980	2, 298	21, 891	1, 893	19, 485	1, 565
Gilbert and Ellice Islands [3]	10, 482	0	9, 233	0	12, 242	0	----------	0
Total	2, 181, 262	182, 903	2, 384, 937	208, 824	2, 137, 745	214, 725	1, 957, 511	197, 641
PRINCIPAL IMPORTING COUNTRIES								
United States	0	469, 115	0	570, 913	0	595, 339	0	457, 947
Germany	777	442, 523	1, 545	539, 130	25	332, 356	27	319, 944
France	145	364, 155	628	421, 130	64	437, 648	158	430, 806
Netherlands	791	308, 530	1, 618	309, 244	945	213, 464	360	191, 077
United Kingdom	0	124, 434	0	147, 403	0	150, 830	0	180, 333
Denmark	0	122, 840	0	154, 339	0	154, 088	0	156, 663
Australia [2]	0	71, 419	0	60, 554	0	40, 239	0	----------
Italy	9	61, 352	8	78, 012	11	71, 183	17	74, 598
Norway	0	43, 568	0	52, 430	0	69, 888	0	59, 520
Austria	6	28, 765	0	27, 905	0	27, 598	0	14, 822
Sweden	0	24, 518	0	12, 026	0	8, 758	0	11, 931
Belgium	113	18, 169	50	23, 924	37	18, 010	203	11, 393
Latvia	0	3, 496	0	4, 993	0	5, 187	0	3, 239
British India	1, 284	2, 926	271	340	204	1, 198	114	2, 453
Total	3, 125	2, 085, 810	4, 120	2, 402, 343	1, 286	2, 125, 786	879	1, 914, 726

COCONUT OIL

Country	Average, 1925–1929 Exports	Average, 1925–1929 Imports	1929 Exports	1929 Imports	1930 Exports	1930 Imports	1931 [1] Exports	1931 [1] Imports
PRINCIPAL EXPORTING COUNTRIES								
Philippine Islands	308, 196	0	420, 019	0	324, 880	0	363, 693	0
Netherlands	121, 614	9, 639	134, 128	9, 674	99, 333	3, 052	87, 578	4, 584
Ceylon	78, 807	13	98, 395	[2] 15	85, 543	5	107, 831	----------
Dutch East Indies	42, 689	10, 562	68, 240	9, 935	31, 903	11, 496	9, 625	11, 309
Germany	33, 181	11, 254	64, 056	23, 176	25, 874	18, 942	19, 796	14, 899
France	29, 644	10, 076	30, 374	9, 875	22, 928	10, 132	17, 632	12, 374
British Malaya	20, 223	58	19, 441	9	21, 217	67	22, 756	560
Australia [3]	398	250	432	168	230	2	----------	----------
Total	634, 752	41, 852	835, 085	52, 852	611, 908	43, 696	628, 911	43, 726
PRINCIPAL IMPORTING COUNTRIES								
United States	21, 691	294, 849	29, 532	411, 936	25, 107	317, 919	18, 068	325, 175
United Kingdom	7, 473	105, 560	10, 779	144, 072	5, 757	94, 512	6, 733	96, 885
Belgium [4]	5, 924	34, 156	7, 586	40, 439	1, 907	18, 470	5, 311	16, 352
Sweden	3, 365	32, 563	1, 118	45, 607	1, 590	46, 492	901	41, 295
Denmark	24, 414	27, 069	42, 820	21, 834	44, 872	15, 698	43, 379	15, 394
British India	1, 037	12, 054	812	16, 858	433	8, 217	371	21, 178
Egypt	1	11, 470	0	12, 675	----------	5, 786	----------	3, 925
Italy [4]	102	8, 724	31	11, 392	101	8, 496	514	3, 982
Rumania	[5] 2	[5] 1, 553	----------	----------	0	1, 442	----------	----------
New Zealand	0	896	0	1, 186	0	797	0	1, 042
Canada	0	739	0	1, 891	0	936	0	1, 737
Total	65, 009	529, 633	92, 678	707, 890	79, 767	518, 765	75, 297	526, 465

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Preliminary.
[2] International Yearbook of Agricultural Statistics.
[3] Year ending June 30.
[4] Includes some other oils.
[5] 3-year average.

TABLE 448.—*Crop summary: Acreage, production, and yield per acre, 1930–1932*

Crop	Acreage harvested 1930	Acreage harvested 1931	Acreage harvested 1932	Unit	Production 1930	Production 1931	Production 1932	Yield per acre 1930	Yield per acre 1931	Yield per acre 1932
	1,000 acres	*1,000 acres*	*1,000 acres*		*Thousands*	*Thousands*	*Thousands*			
Corn	100,793	105,301	107,729	Bushels	2,059,641	2,567,306	2,908,045	20.4	24.4	27.0
Wheat:										
Winter	39,463	41,357	33,656	do	599,593	787,393	462,151	15.2	19.0	13.7
Durum, 4 States	4,745	2,960	3,863	do	57,719	20,712	39,868	12.2	7.0	10.3
Other spring, United States	16,932	11,027	17,658	do	200,115	92,114	224,812	11.8	8.4	12.7
All	61,140	55,344	55,177	do	857,427	900,219	726,831	14.0	16.3	13.2
Oats	39,597	39,800	41,224	do	1,276,035	1,117,970	242,437	32.2	28.1	30.1
Barley	12,666	11,419	13,213	do	303,752	198,389	299,950	24.0	17.4	22.7
Rye	3,543	3,060	3,271	do	45,481	32,026	39,855	12.8	10.5	12.2
Buckwheat	573	505	464	do	6,960	8,890	6,844	12.1	17.6	14.8
Flaxseed	3,736	2,416	2,087	do	21,287	11,798	11,841	5.7	4.9	5.7
Rice, 4 States	961	978	869	do	44,923	46,012	39,356	46.7	47.0	45.3
Grain sorghums	6,586	7,156	7,850	do	64,416	105,214	105,871	9.8	14.7	13.5
Cotton	45,091	40,693	37,589	Bales	13,932	17,096	12,727	[1] 147.9	[1] 201.2	[1] 162.1
Cottonseed				Tons	6,190	7,602	5,650			
Hay, all tame	52,623	53,879	52,819	do	63,566	65,058	69,609	1.21	1.21	1.32
Hay, wild	13,793	12,259	14,298	do	10,744	8,378	12,179	.78	.68	.85
All hay	66,416	66,138	67,117	do	74,310	73,436	81,788	1.12	1.11	1.22
Sorgo (for forage and hay) [2]	1,818	2,333	2,633	do	2,698	3,635	3,948	1.48	1.56	1.50
Timothy seed	428	509	442	Bushels	1,740	2,046	1,781	4.06	4.02	4.03
Clover seed (red and alsike)	1,055	850	1,087	do	1,491	1,138	1,688	1.41	1.34	1.55
Sweetclover seed	219	248	180	do	848	838	573	3.88	3.38	3.17
Lespedeza seed	42	73	74	do	128	311	294	3.07	4.26	3.90
Alfalfa seed	441	361	275	do	1,166	839	538	2.64	2.32	1.96
Beans, dry, edible	2,110	1,883	1,348	Bags [3]	13,900	12,662	10,095	[1] 659	[1] 672	[1] 749
Soybeans [4 5 6]	1,205	1,285	1,155	Bushels	15,853	19,241	16,953	13.2	15.0	14.7
Peanuts [5 6]	1,862	2,145	2,421	Pounds	1,176,760	1,538,790	1,403,050	632	717	580
Cow peas [4 5 6]	678	1,020	1,218	Bushels	5,946	10,484	11,007	8.8	10.3	9.0
Velvetbeans [5]	1,201	1,044	1,401	Tons	470	382	586	[1] 783	[1] 732	[1] 836
Potatoes	3,038	3,375	3,368	Bushels	333,936	375,310	356,589	109.9	111.2	105.0
Sweetpotatoes	649	785	926	do	53,117	63,043	78,484	81.8	80.3	84.8
Tobacco	2,112	2,016	1,433	Pounds	1,647,377	1,604,226	1,033,330	780	796	721
Sugar beets	775	713	768	Tons	9,199	7,903	8,991	11.9	11.1	11.7
Sugarcane, Louisiana	187	184	217	do	3,101	2,717	3,401	16.6	14.8	15.7
Cane sirup	104	103	114	Gallons	16,834	14,359	18,179	161.9	139.4	159.5
Sorgo sirup	165	259	250	do	8,916	17,818	15,209	54.0	68.8	60.8
Maple sugar	[7] 13,002	[7] 12,079	[7] 12,033	Pounds	2,338	1,616	1,601	[8] 2.40	[8] 1.58	[8] 1.72
Maple sirup	[7] 13,002	[7] 12,079	[7] 12,033	Gallons	3,607	2,186	2,394	[8] 2.40	[8] 1.58	[8] 1.72
Broomcorn	391	295	285	Tons	50	44	34	[1] 255	[1] 300	[1] 235
Hops	20	21	22	Pounds	23,447	26,410	24,120	1,202	1,234	1,090
Apples, total				Bushels	153,324	202,415	[9] 139,156			
Apples, commercial				Barrels	33,529	34,592	28,273			
Peaches				Bushels	[9] 54,199	[9] 76,586	[9] 46,267			
Pears				do	[9] 25,633	[9] 23,346	[9] 21,981			
Grapes, total [10]				Tons	[9] 2,441	[9] 1,622	[9] 2,162			
Cherries (12 States)				do	114	[9] 111	[9] 126			
Plums and prunes, fresh (4 States)				do	148	[9] 117	[9] 153			
Prunes, dried (4 States)				do	[9] 303	239	[9] 204			
Oranges (7 States)				Boxes	54,694	49,734	48,788			
Grapefruit (4 States)				do	18,825	15,147	13,221			
Lemons (California)				do	7,950	7,800	7,000			
Cranberries	28	28	28	Barrels	560	651	525	20.2	23.5	19.0
Pecans				Pounds	51,640	77,800	53,160			

Footnotes at end of table.

TABLE 448.—*Crop summary: Acreage, production, and yield per acre, 1930–1932*—Continued

Crop	Acreage harvested			Unit	Production			Yield per acre		
	1930	1931	1932		1930	1931	1932	1930	1931	1932
Commercial truck crops:	*1,000 acres*	*1,000 acres*	*1,000 acres*		*Thousands*	*Thousands*	*Thousands*			
Asparagus [11]	96.8	102.0	110.8	Crates	10,387	9,189	9,049	107	90	82
Beans, Lima [11]	40.9	37.4	25.6	Tons	21.2	23.3	17.6	.52	.62	.69
Beans, snap [11]	189.3	168.4	150.0	do	[9] 213.0	[9] 187.3	[9] 175.3	1.13	1.11	1.17
Beets [11]	21.3	15.7	13.8	do	112.4	[9] 98.5	73.9	5.28	6.26	5.37
Cabbage [11]	151.9	149.9	137.7	do	1,018.3	[9] 1,018.8	[9] 964.4	6.70	6.80	7.01
Cantaloupes	129.0	138.3	135.0	Crates	15,939	[9] 17,998	17,096	124	130	127
Carrots [11]	30.8	30.9	29.4	Bushels	[9] 11,387	[9] 12,916	[9] 10,867	370	395	370
Cauliflower	27.6	27.7	29.8	Crates	5,849	6,961	[9] 7,364	212	251	247
Celery	33.9	34.4	36.5	do	9,900	9,578	[9] 10,184	292	278	279
Corn, sweet (canning).	375.6	356.7	160.9	Tons	659.6	781.6	373.6	1.76	2.19	2.32
Cucumbers [12]	58.6	52.1	44.7	Bushels	[9] 6,194	[9] 4,869	[9] 3,282	109	94	73
Eggplant	3.6	3.8	3.6	do	798	775	809	222	207	222
Lettuce	172.6	175.1	162.3	Crates	19,591	19,466	[9] 17,715	113	111	109
Onions	83.1	77.6	91.7	Bushels	[9] 26,002	[9] 19,128	[9] 28,341	313	246	309
Peas, green [11]	346.9	305.6	297.7	Tons	350.7	241.3	226.0	1.01	.79	.76
Peppers	17.2	18.4	17.2	Bushels	3,680	4,578	3,828	214	248	223
Potatoes, early	325.1	346.8	276.5	do	43,859	46,093	33,495	135	133	121
Spinach [11]	55.7	57.0	53.7	Tons	151.5	[9] 171.2	[9] 133.4	2.72	3.00	2.49
Strawberries [11]	175.7	152.4	192.4	Crates	9,534	11,322	13,574	54.3	74.3	70.5
Tomatoes [11]	564.3	455.8	438.5	Tons	[9] 2,230.8	[9] 1,446.2	[9] 1,656.1	3.95	3.17	3.78
Watermelons	235.5	238.8	232.8	Number	[9] 82,401	[9] 75,509	[9] 60,520	350	316	260
Miscellaneous [13]	42.9	39.6	39.4							
Total truck crops—										
For market [14]	1,589.9	1,603.3	1,665.2							
For manufacture.[12]	1,261.4	1,034.5	738.3							
Total, all crops, with duplications eliminated.	357,530	349,943	352,826							

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board.

[1] Pounds.
[2] *Not included in tame hay.*
[3] Bags of 100 pounds.
[4] Total except hay.
[5] Including crop grazed or hogged off in the Southern States.
[6] Including acres planted in corn in the South reduced to equivalent solid acres.
[7] Trees tapped.
[8] Total equivalent sugar per tree.
[9] Includes some quantities not harvested.
[10] Production is the total for fresh fruit, juice, and raisins.
[11] Includes production used for canning or manufacture.
[12] Does not include estimates of cucumbers grown for pickles.
[13] Includes following crops in certain States: Artichokes, sweet corn, and kale for market, and pimientos for manufacture.
[14] Except potatoes.

TABLE 449.—*Indexes of the volume of net agricultural production,[1] 1919–1932*

[1919–1927 = 100]

Year	Grains	Fruits and vegetables	Truck crops	Meat animals	Dairy products	Poultry products	Cotton and cottonseed	Total
	Index No.	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1919	101	82	71	96	81	85	91	91
1920	116	102	86	92	80	84	105	97
1921	100	76	74	91	91	95	64	87
1922	100	109	101	97	95	98	77	96
1923	97	108	99	107	103	107	80	101
1924	100	106	111	108	109	100	108	106
1925	95	98	115	102	110	104	128	106
1926	93	116	114	103	114	111	143	111
1927	97	104	129	103	116	116	103	106
1928	106	122	124	105	119	112	114	111
1929	87	102	141	105	122	116	118	109
1930	77	113	141	101	123	119	110	107
1931	80	119	132	103	126	119	134	112
1932 [2]	78	106	137	104	125	116	102	104

Bureau of Agricultural Economics.

[1] These indexes are based on estimates of production for sale and for consumption in the farm home. Production fed to livestock or used for seed is not included. For example, instead of total production, only the amounts of corn and oats shipped out of county where grown and only a small percentage of the hay crops are included. The index of dairy products represents total milk production for all purposes. Production of meat animals is represented by total slaughter, including slaughter for farm use. Calendar-year production of livestock and livestock products are here compared with crop production of the same year. Each group index as well as the total is obtained by multiplying the yearly quantities by a 1919–1927 average farm price received by producers for each of the commodities, and the sum of these yearly values at average prices, divided by the corresponding average sum for the period 1919–1927, taken as 100. The following commodities included in the index contribute about 90 per cent of the gross income from agricultural production: Grains—wheat, corn, oats, barley, rye, buckwheat, kafir, rice; fruits and vegetables—grapes, apples, apricots, peaches, pears, cranberries, figs, grapefruit, lemons, olives, oranges, potatoes, sweetpotatoes, dry edible beans; truck crops—asparagus, snap beans, cabbage, cantaloupes, cauliflower, celery, cucumbers, lettuce, onions, peas, spinach, strawberries, tomatoes, watermelons; meat animals—cattle, calves, sheep, lambs, hogs; dairy products—milk total production; poultry products—chickens and eggs; cotton and cottonseed; total includes also tobacco, wool, and hay.

[2] Preliminary.

Table 450.—*Total harvested acreage of principal field crops, by States, 1930–1932*

State and division	1930	1931	1932
	Acres	*Acres*	*Acres*
Me.	1, 337, 800	1, 330, 600	1, 323, 500
N. H.	383, 100	376, 900	368, 600
Vt.	1, 062, 300	1, 068, 400	1, 074, 800
Mass.	410, 300	406, 400	404, 600
R. I.	49, 000	47, 000	48, 000
Conn.	356, 600	347, 600	342, 800
N. Y.	6, 508, 600	6, 482, 900	6, 508, 200
N. J.	656, 600	643, 100	637, 200
Pa.	6, 259, 100	6, 215, 600	6, 127, 200
N. A.	17, 022, 400	16, 918, 500	16, 834, 900
Ohio	9, 695, 500	9, 967, 600	9, 426, 400
Ind.	10, 271, 000	10, 783, 300	10, 337, 200
Ill.	18, 521, 600	18, 702, 300	18, 206, 500
Mich.	7, 332, 000	7, 414, 700	7, 235, 500
Wis.	9, 547, 800	9, 526, 500	9, 530, 300
Minn.	18, 391, 800	18, 698, 900	18, 705, 800
Iowa	22, 422, 800	22, 293, 300	22, 268, 700
Mo.	13, 182, 400	13, 352, 100	12, 826, 000
N. Dak.	21, 286, 800	16, 225, 300	21, 528, 000
S. Dak.	18, 219, 400	15, 108, 600	17, 896, 800
Nebr.	21, 907, 600	21, 748, 100	21, 602, 000
Kans.	24, 626, 200	25, 185, 400	23, 114, 400
N. C.	195, 404, 900	189, 006, 100	192, 477, 600
Del.	380, 800	380, 600	376, 800
Md.	1, 659, 200	1, 661, 100	1, 639, 000
Va.	3, 676, 900	3, 801, 900	3, 575, 100
W. Va.	1, 372, 500	1, 447, 900	1, 409, 300
N. C.	6, 171, 000	6, 159, 600	6, 048, 500
S. C.	4, 583, 700	4, 549, 200	4, 591, 200
Ga.	8, 608, 000	8, 781, 900	8, 763, 800
Fla.	1, 171, 000	1, 195, 900	1, 191, 700
S. A.	27, 623, 100	27, 978, 100	27, 535, 400
Ky.	4, 953, 200	5, 397, 700	5, 041, 500
Tenn.	5, 951, 800	6, 178, 600	6, 100, 800
Ala.	7, 393, 200	7, 518, 100	7, 514, 600
Miss.	6, 686, 500	6, 919, 500	6, 834, 300
Ark.	6, 816, 900	6, 867, 400	6, 745, 000
La.	4, 241, 600	4, 287, 800	4, 092, 100
Okla.	14, 910, 400	15, 692, 400	15, 037, 900
Tex.	31, 607, 100	32, 642, 900	30, 878, 400
S. C.	82, 560, 700	85, 504, 400	82, 244, 600
Mont.	7, 758, 400	4, 978, 700	7, 775, 500
Idaho	3, 012, 400	2, 714, 200	3, 016, 500
Wyo.	2, 036, 000	1, 792, 900	1, 938, 700
Colo.	7, 103, 300	6, 580, 200	5, 723, 000
N. Mex.	1, 377, 600	1, 636, 800	1, 548, 600
Ariz.	515, 100	481, 700	437, 600
Utah	1, 169, 700	1, 113, 000	1, 185, 800
Nev.	392, 800	239, 700	378, 800
Wash.	3, 468, 000	3, 563, 800	3, 520, 200
Oreg.	2, 618, 200	2, 527, 000	2, 728, 600
Calif.	5, 087, 800	4, 559, 900	5, 163, 300
West	34, 539, 300	30, 187, 900	33, 416, 600
U. S.	[1] 357, 150, 400	[1] 349, 595, 000	[1] 352, 509, 100

Bureau of Agricultural Economics. Estimates of the Crop Reporting Board. [1] Differs from totals in Table 448 in that cranberries, hops, artichokes, beets, carrots, eggplant, kale, Lima beans, peppers, pimientos, sweet corn (for market), and strawberries are excluded and for annual legumes only acreage grown alone is included.

TABLE 451.—*Gross income from farm production, by States, 1929–1931*

State	Crops			Livestock and livestock products			Crops and livestock products combined		
	1929	1930	1931	1929	1930	1931	1929	1930	1931
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	68, 723	44, 837	21, 440	34, 431	32, 926	26, 844	103, 154	77, 763	48, 284
New Hampshire	8, 041	8, 129	5, 474	22, 002	20, 461	16, 613	30, 043	28, 590	22, 087
Vermont	12, 866	12, 655	8, 043	45, 050	41, 209	31, 757	57, 916	53, 864	39, 800
Massachusetts	40, 252	35, 110	27, 731	46, 035	45, 069	37, 066	86, 287	80, 179	64, 707
Rhode Island	*3, 721*	*3, 341*	*2, 702*	*7, 367*	*7, 386*	*5, 955*	*11, 088*	*10, 727*	*8, 657*
Connecticut	28, 559	26, 515	18, 277	38, 650	36, 738	32, 020	67, 209	63, 253	50, 297
New York	143, 207	133, 071	97, 716	292, 014	263, 033	203, 617	435, 221	396, 104	301, 333
New Jersey	51, 918	52, 307	36, 198	54, 137	50, 686	41, 519	106, 055	103, 083	77, 717
Pennsylvania	114, 905	92, 276	75, 717	250, 692	228, 068	181, 435	365, 597	320, 344	257, 152
Ohio	120, 495	87, 774	86, 486	297, 021	254, 753	184, 418	417, 516	342, 527	270, 904
Indiana	92, 866	69, 020	55, 847	263, 157	216, 402	156, 504	356, 023	285, 422	212, 351
Illinois	213, 611	137, 787	108, 150	368, 669	330, 884	237, 927	582, 280	468, 671	346, 077
Michigan	102, 863	82, 605	60, 583	193, 548	162, 382	121, 973	296, 411	244, 987	182, 556
Wisconsin	76, 438	60, 606	36, 666	369, 816	303, 996	222, 764	446, 254	364, 602	259, 430
Minnesota	114, 504	88, 186	51, 146	344, 047	297, 892	217, 252	458, 551	386, 078	268, 398
Iowa	149, 429	87, 738	50, 546	597, 218	533, 079	375, 722	746, 647	620, 817	426, 268
Missouri	91, 023	59, 703	54, 627	314, 703	266, 539	187, 573	405, 726	326, 242	242, 200
North Dakota	123, 884	75, 632	16, 176	90, 661	72, 337	55, 665	214, 545	147, 969	71, 841
South Dakota	74, 681	43, 423	6, 845	168, 116	150, 013	116, 936	242, 797	193, 436	123, 781
Nebraska	135, 195	99, 782	44, 898	323, 109	279, 925	208, 333	458, 304	379, 707	253, 231
Kansas	183, 536	113, 823	92, 134	278, 703	232, 946	159, 255	462, 239	346, 769	251, 389
Delaware	12, 589	8, 992	6, 678	10, 381	8, 853	7, 202	22, 970	17, 845	13, 880
Maryland	50, 817	31, 724	31, 856	50, 705	44, 779	35, 996	101, 522	76, 503	67, 852
Virginia	119, 777	70, 940	61, 355	98, 454	82, 356	66, 293	218, 231	153, 296	127, 648
West Virginia	31, 286	20, 717	20, 818	53, 997	47, 632	38, 444	85, 283	68, 349	59, 262
North Carolina	226, 356	182, 589	119, 488	84, 192	71, 621	60, 818	310, 548	254, 210	180, 306
South Carolina	119, 801	95, 586	62, 496	38, 134	34, 752	28, 667	157, 935	130, 338	91, 163
Georgia	199, 019	147, 341	85, 216	71, 562	62, 736	47, 060	270, 581	210, 077	132, 276
Florida	103, 980	112, 259	81, 505	25, 584	23, 675	20, 120	129, 564	135, 934	101, 625
Kentucky	113, 956	75, 976	79, 734	122, 610	98, 892	70, 045	236, 566	174, 868	149, 779
Tennessee	125, 422	81, 884	68, 235	103, 611	86, 900	62, 427	229, 033	168, 784	130, 662
Alabama	168, 469	116, 827	81, 873	63, 202	55, 784	43, 480	231, 671	172, 611	125, 353
Mississippi	227, 389	114, 816	89, 445	58, 228	51, 382	37, 708	285, 617	166, 198	127, 153
Arkansas	179, 088	76, 777	88, 128	62, 409	50, 079	36, 712	241, 497	126, 856	124, 840
Louisiana	136, 468	92, 022	72, 858	40, 359	37, 427	28, 581	176, 827	129, 449	101, 439
Oklahoma	181, 893	86, 270	75, 928	132, 737	104, 988	76, 489	314, 630	191, 258	152, 417
Texas	503, 002	331, 019	265, 559	283, 726	240, 954	176, 485	786, 728	571, 973	442, 044
Montana	51, 970	32, 484	14, 126	79, 811	58, 652	47, 803	131, 781	91, 136	61, 929
Idaho	69, 471	50, 527	27, 587	59, 766	46, 795	35, 289	129, 237	97, 322	62, 876
Wyoming	14, 471	13, 499	7, 697	43, 891	31, 414	25, 677	58, 362	44, 913	33, 374
Colorado	83, 236	78, 934	37, 034	84, 621	75, 575	58, 382	167, 857	154, 509	95, 416
New Mexico	24, 999	13, 712	11, 633	39, 199	29, 327	21, 609	64, 198	43, 039	33, 242
Arizona	*35, 286*	*23, 976*	*13, 597*	*23, 359*	*20, 434*	*16, 313*	*58, 645*	*44, 410*	*29, 910*
Utah	19, 389	18, 122	11, 435	43, 482	34, 964	26, 533	62, 871	53, 086	37, 968
Nevada	2, 386	1, 474	906	16, 910	11, 661	9, 025	19, 296	13, 135	9, 931
Washington	127, 006	93, 757	61, 005	87, 420	75, 082	58, 543	214, 426	168, 839	119, 548
Oregon	68, 100	48, 769	32, 131	76, 413	63, 254	48, 051	144, 513	112, 023	80, 182
California	482, 528	372, 056	295, 522	249, 758	205, 828	173, 895	732, 286	577, 884	469, 417
Total	5, 433, 343	3, 813, 519	2, 766, 406	6, 503, 667	5, 582, 520	4, 178, 795	11,937,010	9, 396, 039	6, 945, 201

Bureau of Agricultural Economics. Totals include sugar beets for "other" States: 1929—4,472; 1930—6,060; 1931—5,159.

TABLE 452.—*Gross income from farm production, United States, by commodities, 1929–1931*

Product	Gross income 1929	Gross income 1930	Gross income 1931
	1,000 dollars	*1,000 dollars*	*1,000 dollars*
CROPS			
Corn	370,849	203,059	134,049
Wheat	697,740	406,153	241,765
Oats	106,447	78,943	42,421
Barley	41,725	33,395	12,291
Rye	17,742	8,263	4,012
Buckwheat	5,925	3,833	2,822
Flaxseed	38,316	31,084	10,991
Rice	38,311	33,805	22,349
Grain sorghums	7,635	4,925	4,076
Emmer and spelt	196	173	83
Popcorn	1,837	2,285	923
Cotton lint	1,245,084	659,150	483,693
Cottonseed	143,696	91,925	44,821
Tobacco	286,104	211,102	156,097
Hay	126,109	99,608	74,883
Sorgo forage	2,751	1,919	1,760
Hemp	97	114	12
Clover seed (red and alsike)	23,626	14,705	7,233
Sweetclover seed	3,205	1,980	1,338
Lespedeza seed	426	242	493
Alfalfa seed	11,019	11,520	5,738
Timothy seed	2,502	4,069	2,712
Dry edible beans	71,044	49,394	23,377
Soybeans	11,197	10,068	4,832
Cowpeas	4,883	4,567	3,521
Peanuts	31,409	22,799	18,651
Broomcorn	5,417	3,267	2,006
Potatoes	366,191	271,938	162,637
Sweetpotatoes	66,953	51,232	39,970
Truck crops	387,364	361,013	285,600
Hops	3,785	3,462	3,564
Apples	184,787	156,711	119,293
Peaches	60,889	44,208	37,883
Pears	30,152	18,932	13,667
Cherries	14,800	14,844	8,651
Plums and apricots	9,954	5,602	5,999
Grapes	55,803	38,960	37,019
Other fruits and nuts	237,051	183,012	156,327
Strawberries	53,846	47,417	44,574
Small fruits	22,185	21,463	24,209

Product	Gross income 1929	Gross income 1930	Gross income 1931
	1,000 dollars	*1,000 dollars*	*1,000 dollars*
Cranberries	7,188	5,688	3,902
Pecans	7,427	7,771	6,030
Sugar beets, for sugar	51,805	65,697	46,701
Sugarcane and sirup	20,790	15,375	12,660
Sorgo sirup	7,130	4,774	5,104
Maple sugar and sirup	5,419	8,587	4,513
Forest products	173,420	146,832	105,092
Farm gardens	226,033	213,568	222,346
Nursery products	61,212	55,202	46,475
Greenhouse products	83,867	79,784	67,145
Total	5,433,343	3,813,519	2,766,406
LIVESTOCK AND LIVESTOCK PRODUCTS			
Cattle and calves	1,111,048	954,857	682,920
Hogs	1,530,724	1,345,508	896,979
Sheep and lambs	165,061	135,950	108,374
Horses	9,403	8,391	6,782
Mules	10,379	7,499	5,984
Chickens	479,898	394,880	327,754
Eggs (chicken)	755,583	626,932	472,402
Milk	2,322,553	2,024,920	1,616,524
Wool	98,920	68,539	50,046
Mohair	7,833	5,703	3,067
Honey	12,265	9,341	7,963
Total	6,503,667	5,582,520	4,178,795
Grand total	11,937,010	9,396,039	6,945,201
United States: After deducting for interstate sales of crops, principally seeds, and adding for "other poultry" not estimated by States	11,950,000	9,400,000	6,955,000

Bureau of Agricultural Economics. Estimated quantities produced, sold, and consumed in farm households times weighted annual prices. Cash income plus value of commodities consumed in farm households equals gross incomes. For feed and seed crops, horses, and mules, value includes sales by farmers in some States eventually bought by farmers in other States. These interfarm sales tend to overestimate the total income from farm production for the country as a whole.

TABLE 453.—*Gross income from farm production by groups of commodities, expenditures, income available for operators' capital, labor, and management and current value of capital employed in agriculture, United States, 1924–1931*

Item	1924	1925	1926	1927	1928	1929	1930	1931
	Million dollars	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*
Crops:								
Grains	1,755	1,496	1,432	1,592	1,513	1,288	774	465
Fruits and nuts	671	683	694	690	705	715	567	476
Vegetables	953	1,193	1,093	1,062	967	1,123	952	736
Sugar crops	104	95	103	104	92	85	94	89
Cotton and cottonseed	1,710	1,740	1,251	1,464	1,470	1,389	751	529
Tobacco	259	251	237	257	278	286	211	156
Other crops	719	689	659	649	650	542	459	333
Total crops	6,170	6,147	5,468	5,817	5,675	5,428	3,808	2,704
Livestock and livestock products:								
Cattle, hogs, and sheep	2,380	2,822	2,922	2,664	2,727	2,807	2,436	1,688
Poultry and eggs	989	1,114	1,167	1,108	1,202	1,254	1,037	812
Dairy products	1,678	1,759	1,805	1,911	1,994	2,323	2,025	1,617
Wool	87	97	88	86	111	99	69	50
Other	33	28	30	30	32	39	31	24
Total livestock	5,167	5,820	6,012	5,799	6,006	6,522	5,598	4,191
Total crops and livestock	11,337	11,968	11,480	11,616	11,741	11,950	9,406	6,955
Operators' expenditures:								
Operating costs [1]	2,547	2,902	2,716	2,853	3,056	3,112	2,777	2,175
Wages to hired labor [2]	1,206	1,219	1,241	1,234	1,228	1,231	1,011	838
Taxes [3]	458	459	465	475	482	490	489	456
Interest [4]	713	705	699	690	684	678	665	650
Rent [5]	927	1,005	999	1,034	1,068	1,110	911	692
Total deductions	5,851	6,290	6,120	6,286	6,518	6,621	5,853	4,811
Balance available for capital, labor, and management:								
Total	5,486	5,678	5,360	5,330	5,223	5,329	3,553	2,144
Per farm, in dollars [6]	861	893	846	843	828	847	566	342
Capital:								
Total [7]	57,773	57,903	56,802	57,337	58,253	58,249	52,990	44,339
Total operators' capital used in production [8]	27,476	27,675	26,932	27,488	28,297	28,339	24,342	18,586
Income available for operators' capital and management [9]	1,081	1,231	826	829	732	810	−543	−1,074
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Income available for operators' capital and management as per cent of operator's capital	3.9	4.4	3.1	3.0	2.6	2.9	−2.2	−5.8

Bureau of Agricultural Economics.

[1] A deduction of 7.5 per cent of total fertilizer costs, 9.5 per cent of feed, 10 per cent of binder twine, 15 per cent of ginning costs, and 20 per cent of repairs on buildings and insurance is estimated as paid by nonfarmer landlords.

[2] Estimates of cash wages and board, and 10 per cent allowance for perquisites and hired domestic labor contributing to production.

[3] 70 per cent of estimated total taxes on all farm real estate paid by operators, less 10 per cent to allow for taxes on farm dwellings.

[4] Paid on all bank loans and on 90 per cent of total farm mortgage debt held by nonfarmers, 10 per cent of the total mortgage debt being assigned to farm dwellings.

[5] Paid on 72 per cent of all rented farms to nonoperators.

[6] Estimated number of farms interpolated between 6,372,000 on Jan. 1, 1925, and 6,289,000 on Apr. 1, 1930.

[7] As of Dec. 31, includes land, buildings, machinery, livestock, and 1 per cent cash working capital.

[8] All capital used in production excluding value of farm indebtedness to nonfarmers and value of farms rented from nonfarmers. This total includes value of autos used for pleasure which probably offsets value of dwellings used for production.

[9] Income available for all capital, labor, and management, less wage allowance for labor of operators and families. Operators are here allowed an annual hire-hand wage without board, and family labor is taken as 22 per cent additional to the operators' labor. The value of the operator's labor is here understated in so far as hired hands receive perquisites in addition to cash and board, and it may be overstated in so far as the operator's time is not entirely spent on farm work.

TABLE 454.—*Current value of agricultural capital, gross income from farm production, and selected expenditures, United States, 1909–1932*

Calendar year	Current value of agricultural capital [1]	Gross income [2]	Selected expenditures: Wages (including board) [3]	Feed [4]	Fertilizer [5]	Farm implements (excluding autos and trucks) [6]	Other farm machinery and their costs of operation [7]	Ginning [8]	Taxes [9]	Interest on mortgages [10]
	Million dollars	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*	*Million dollars*
1909	41, 354	6, 238	652	300	115	192	....	33	262	199
1910	42, 985	6, 043	674	302	137	219	....	39	268	210
1911	44, 086	6, 372	673	372	152	217	....	52	275	221
1912	46, 081	6, 784	697	336	153	244	....	45	278	232
1913	47, 778	6, 975	721	453	172	266	....	46	280	240
1914	47, 965	7, 028	696	431	188	285	....	56	292	252
1915	50, 533	7, 395	701	471	158	296	....	43	298	260
1916	55, 041	8, 914	766	638	163	357	....	50	304	299
1917	61, 576	12, 832	941	871	217	513	....	54	310	345
1918	67, 055	15, 101	1, 162	1, 023	297	605	....	64	345	401
1919	66, 630	16, 935	1, 356	1, 097	326	693	....	77	380	469
1920	78, 436	13, 566	1, 557	726	359	594	....	91	452	546
1921	71, 146	8, 927	997	484	217	239	....	47	633	554
1922	62, 022	9, 944	971	598	210	281	....	59	678	568
1923	60, 356	11, 040	1, 098	670	229	393	....	61	718	564
1924	58, 244	11, 337	1, 074	750	231	350	755	82	727	567
1925	57, 189	11, 968	1, 118	828	255	429	915	100	729	568
1926	57, 255	11, 480	1, 161	734	253	460	741	121	738	568
1927	56, 145	11, 616	1, 175	789	234	494	874	73	754	568
1928	56, 561	11, 741	1, 183	897	273	508	916	88	766	563
1929	57, 600	11, 918	1, 194	840	256	578	885	89	777	554
1930	57, 672	9, 414	1, 011	497	174	460	786	77	738	540
1931 [11]	52, 276	6, 911	734	359	96	267	691	74	620	520
1932	43, 316	5, 143	475	....	....	110	....	54	....	510

Bureau of Agricultural Economics. Tentative estimates of the bureau.

[1] As of end of year. Includes land, buildings, machinery, livestock, and working capital (estimated at 1 per cent of other items). Interpolation between census estimates: Land and buildings based on index of land values per acre and straight line interpolation of total acreage in farms; livestock, annual estimates of U. S. Department of Agriculture; machinery, interpolated on basis of estimated values of land and buildings, 1909–1919, straight line interpolations, 1920–1924 and 1925–1930.

[2] 1924–1930, Table 457; 1909–1923 based on items which represent 95 per cent of gross income in 1924–1930.

[3] Interpolations between census estimates, based on U. S. Department of Agriculture index of farm wages.

[4] Interpolation between census years based on an index of prices paid by farmers for feed and an index of production of feed crops. The product of the two indexes was adjusted to equal the census values of feed purchased.

[5] Interpolated between census estimates, based on index of value derived from total fertilizer consumption and U. S. Department of Agriculture index of fertilizer prices paid by farmers.

[6] 1909–1919: 1909, 1914, and 1919 census values of farm implements produced adjusted to represent total farm equipment sold in the United States at farm values. Interpolations for other years to 1920 based on gross income from farm production. 1920–1930 estimates based largely on factory value of farm implements sold in the United States raised to represent farm values.

[7] Includes estimated cost of operating automobiles, trucks, and tractors; 90 per cent of annual farm purchases of autos and trucks, and harness and saddlery.

[8] Annual cotton production, multiplied by ginning costs per bale.

[9] 1924–1930, estimates based on annual survey of tax rates per acre. 1914–1923, based on index of taxes as published, and estimate for 1924. 1909–1913, based on average of indexes of taxes for three States, New York, Ohio, and Kansas.

[10] Interpolations between total farm mortgages for 1910, 1920, 1925, 1928, 1930, using smoothed estimates for 1911–1919 derived from value of current agricultural capital, and smooth curve, 1920–1930.

[11] Preliminary.

TABLE 455.—*Farm returns, 1923–1931*

[Averages of reports of owner operators for their own farms for calendar year]

Item	United									North Atlantic		East North Central		West North Central		South Atlantic		South Central		Western	
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931
Reports .... number	16,183	15,103	15,330	13,475	13,859	11,851	11,805	6,228	7,437	703	821	1,355	1,605	1,477	1,654	643	624	1,361	1,765	689	968
Size of farm .... acres	298	303	304	315	275	284	270	284	249	137	139	148	140	360	345	198	187	246	212	693	462
Value of farm real estate, Jan. 1	$14,530	$14,323	$14,157	$13,379	$12,543	$12,299	$12,090	$12,009	$10,778	$8,286	$8,083	$11,789	$9,802	$17,152	$13,775	$8,152	$6,251	$8,346	$6,778	$16,050	$19,773
Value of farm personalty, Jan. 1	2,960	2,937	2,965	2,929	2,893	3,118	3,152	3,156	2,426	3,513	3,151	2,988	2,310	4,387	3,233	1,788	1,262	1,780	1,268	4,484	3,479
Receipts:																					
Crop sales	850	1,012	993	926	978	946	1,029	779	572	848	627	454	280	687	304	778	497	794	527	1,520	1,597
Sales of livestock	760	780	897	894	851	936	922	765	471	431	317	774	507	1,520	848	322	256	289	185	818	556
Sales of livestock products	550	570	585	589	638	689	681	635	482	1,607	1,300	830	614	452	356	352	272	233	148	713	525
Miscellaneous other	80	72	76	39	38	37	37	32	24	72	46	31	22	28	21	26	20	18	12	30	42
Total	2,240	2,434	2,551	2,448	2,505	2,608	2,669	2,211	1,549	2,958	2,290	2,089	1,423	2,687	1,529	1,478	1,045	1,334	872	3,081	2,720
Cash outlay:																					
Hired labor	350	384	386	386	397	394	399	378	304	494	413	265	188	323	182	368	258	333	221	699	795
Livestock bought	240	222	242	242	238	238	238	172	102	126	132	145	98	336	148	98	97	76	46	175	110
Feed bought	210	248	244	232	243	262	276	276	184	639	433	251	151	296	185	163	114	132	88	302	250
Fertilizer	60	66	69	73	64	67	79	78	55	131	120	58	42	13	7	231	163	90	39	35	63
Seed	40	44	47	48	49	46	43	43	34	64	58	44	35	48	37	33	25	30	22	47	32
Taxes on farm property	190	192	191	183	180	184	187	196	183	167	163	228	191	252	220	117	96	121	111	268	313
Machinery and tools	110	103	119	130	129	151	159	118	62	145	108	91	63	199	69	55	28	56	28	150	103
Miscellaneous other	150	151	179	179	157	176	191	191	167	210	200	163	132	224	165	89	68	111	64	407	455
Total	1,350	1,410	1,477	1,473	1,457	1,518	1,572	1,452	1,091	1,976	1,627	1,245	890	1,691	1,013	1,154	849	949	619	2,083	2,121
Receipts less cash outlay	890	1,024	1,074	975	1,048	1,090	1,097	759	458	982	663	844	533	996	516	324	196	385	253	998	599
Increase in inventory of personal property	130	181	223	158	242	244	201	−221	−304	−100	−218	−240	−331	−401	−694	−110	19	−168	−37	−130	−357
Net result	1,020	1,205	1,297	1,133	1,290	1,334	1,298	538	154	882	445	604	202	595	−178	214	215	217	216	868	242
Interest paid	230	230	225	215	201	202	199	199	196	106	107	170	170	320	289	99	82	137	121	307	364
Spent for farm improvements	140	133	131	128	141	126	125	92	57	117	99	96	54	99	53	81	28	59	34	117	92
Value of food produced and used on the farm [1]	265	266	274	282	273	269	262	242	200	257	212	246	206	249	202	266	228	220	187	219	180
Value of family labor, including owner [1]	870	789	793	779	768	768	772	716	608	865	779	767	614	844	695	472	375	464	385	914	821

Change in value of real estate during the year (minus sign (−) shows decrease)	−66	+145	+173	+2	+61	+72	+27	−757	−1,281	−158	−482	−697	−1,110	−1,216	−2,076	−526	−682	−647	−884	−938	−1,998

Bureau of Agricultural Economics. Compiled from reports of individual farms operated by their owners. Division averages for 1923-24 in Agriculture Yearbook, 1925, pp. 1342-1343; for 1925-26 in Agriculture Yearbook, 1927, p. 1333; for 1927-28, in Agriculture Yearbook, 1930, pp. 972-973; and for 1929-30 in Agriculture Yearbook, 1932, pp. 894-895.

[1] Averages of farms for which the item was reported.

TABLE 456.—*Farm returns: Proportion of farmers obtaining net results within specified ranges, 1923-1931*

Item	United States									North Atlantic		East North Central		West North Central		South Atlantic		South Central		Western	
	1923	1924	1925	1926	1927	1928	1929	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931	1930	1931
Reports ... number	16,183	15,103	15,330	13,475	13,859	11,851	11,805	6,228	7,437	703	821	1,355	1,605	1,477	1,654	643	624	1,361	1,765	689	968
Size of farm ... acres	298	303	304	315	275	284	270	284	249	137	139	148	140	360	345	198	187	246	212	693	462
Value of farm property Jan. 1 per farm ... dollars	17,490	17,260	17,122	16,308	15,436	15,417	15,242	15,165	13,204	11,799	11,234	14,777	12,112	21,539	17,008	9,940	7,513	10,126	8,046	20,534	23,252
Net result per farm ... do	1,020	1,205	1,297	1,133	1,290	1,334	1,298	538	154	882	445	604	202	595	−178	214	215	217	216	868	242
Proportion obtaining:	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
$5,000 or more	1.88	2.69	3.00	2.29	3.19	3.12	2.94	1.03	0.37	1.58	0.25	0.74	0.12	1.01	-----	0.78	0.32	0.51	0.06	2.32	1.35
$3,000 to $4,999	4.67	8.10	6.82	5.49	6.42	6.77	6.24	2.37	.63	3.98	1.94	1.92	.19	3.18	0.06	.93	.80	1.03	.23	3.92	1.86
$2,500 to $2,999	2.88	3.61	4.03	3.59	3.86	4.06	4.25	1.96	.63	2.70	1.70	1.18	.37	2.98	.30	.78	.32	.96	.23	3.63	1.65
$2,000 to $2,499	5.13	5.99	6.26	5.46	6.53	6.35	6.01	3.20	.90	4.84	2.80	3.32	.12	4.40	.67	1.87	.80	1.03	.23	4.21	2.27
$1,500 to $1,999	8.91	9.30	9.92	9.05	9.58	10.35	10.35	5.38	2.14	7.26	4.26	6.42	1.99	6.84	1.75	2.33	1.45	1.47	1.53	8.85	2.79
$1,000 to $1,499	14.49	15.13	15.44	14.09	15.46	15.23	14.89	9.41	4.65	15.65	9.50	11.22	5.55	9.75	2.96	4.51	3.05	4.56	2.32	12.92	7.13
$500 to $999	23.07	21.86	21.79	22.10	22.07	22.07	22.63	17.23	14.84	19.49	18.64	21.33	16.76	17.74	12.21	14.15	13.78	12.78	14.56	17.42	14.15
$0 to $499	26.09	24.68	22.32	26.43	23.98	23.19	24.76	29.93	39.77	27.03	30.69	31.58	41.74	24.85	30.23	36.08	45.83	34.68	53.99	25.40	30.68
$0 to −$499	9.10	7.85	7.81	8.56	6.68	7.20	6.37	19.76	23.52	13.37	20.22	18.16	24.18	15.44	25.88	26.13	27.56	33.06	23.23	10.45	19.11
−$500 to −$999	2.07	1.57	1.54	1.69	1.28	1.04	1.01	5.54	6.87	2.42	6.10	3.69	6.11	7.04	12.70	7.93	4.33	6.76	2.66	4.50	8.16
−$1,000 or more	1.71	1.22	1.07	1.25	.95	.62	.55	4.19	5.78	1.70	3.90	2.44	2.87	6.77	13.24	4.51	1.76	3.16	.96	6.38	10.55
All farms reporting	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Bureau of Agricultural Economics. The reports are those tabulated in Table 455 (preceding). For distribution by geographical divisions, see Table 476, Yearbook 1927; Table 509, Yearbook 1928; Table 511, Yearbook 1930; Table 574, Yearbook 1931; and Table 460, Yearbook 1932.

TABLE 457.—*Wheat, all: Cost of production, selected States, 1931*

State	Acreage harvested	Production	Average yield per acre	Gross cost per acre								Credit per acre (straw)	Net cost per acre		Net cost per bushel	
				Prepare and plant	Harvest and thresh	Haul to market	Fertilizer and manure	Seed	Land rent	Miscellaneous [1]	Total		Including rent	Excluding rent	Including rent	Excluding rent
	1,000 acres	*1,000 bushels*	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York	211	5,311	25.2	5.34	5.23	1.41	5.10	1.82	5.40	3.00	27.30	3.08	24.22	18.82	0.96	0.75
Pennsylvania	909	19,987	22.0	5.17	4.44	1.29	4.70	1.61	5.18	2.65	25.04	4.97	20.07	14.89	.91	.68
Maryland	404	9,696	24.0	3.92	4.19	.98	4.46	1.27	4.83	2.32	21.97	2.98	18.99	14.16	.79	.59
Virginia	603	13,266	22.0	4.11	4.01	1.32	4.13	1.30	4.55	1.84	21.26	1.63	19.63	15.08	.89	.69
West Virginia	113	2,373	21.0	4.23	4.59	1.30	3.48	1.46	4.11	2.34	21.51	2.58	18.93	14.82	.90	.71
Michigan	711	18,446	25.9	4.60	3.90	1.11	4.04	1.36	3.65	2.30	20.95	1.69	19.26	15.61	.74	.60
Ohio	1,723	50,744	29.5	3.36	4.60	1.21	2.98	1.60	4.71	2.13	20.59	1.31	19.28	14.57	.65	.49
Indiana	1,694	43,741	25.8	3.04	4.02	.90	2.63	1.35	4.47	1.83	18.24	1.37	16.87	12.40	.65	.48
Illinois	1,935	45,076	23.3	2.69	3.18	.81	.82	1.05	4.79	1.86	15.20	.64	14.56	9.77	.62	.42
Iowa	357	7,120	19.9	2.64	3.36	.71	.65	1.17	5.92	2.01	16.46	.62	15.84	9.92	.80	.50
Minnesota	1,224	18,011	14.7	2.92	2.88	.62	.64	1.22	3.43	1.81	13.52	.30	13.22	9.79	.90	.67
North Dakota	6,204	32,717	5.3	2.49	1.80	.31	.15	.97	2.38	2.79	10.89	.25	10.64	8.26	2.01	1.56
South Dakota	2,796	15,831	5.7	1.65	1.74	.32	.09	.77	2.39	2.15	9.11	.13	8.98	6.59	1.58	1.16
Montana	2,182	14,684	6.7	2.67	1.96	.40	.05	.65	1.98	2.74	10.45	.30	10.15	8.17	1.51	1.22
Nebraska	3,465	58,376	16.8	2.13	2.39	.51	.11	.67	3.53	1.59	10.93	.19	10.74	7.21	.64	.43
Kansas	12,632	239,868	19.0	2.14	2.37	.71	.34	.62	2.61	1.90	10.69	.14	10.55	7.94	.56	.42
Missouri	1,497	29,933	20.0	2.52	3.28	1.00	1.00	.96	3.31	1.63	14.60	.87	13.73	10.42	.69	.52
Oklahoma	4,407	74,919	17.0	1.83	2.49	.67	.09	.63	2.44	1.43	9.58	.18	9.40	6.96	.55	.41
Texas	3,890	57,572	14.8	1.97	1.84	.63	.01	.49	2.72	1.37	9.03	.14	8.89	6.17	.60	.42

Bureau of Agricultural Economics.

[1] Includes miscellaneous labor, irrigation (including water), seed treatment, sacks and twine, crop insurance, use of implements, use of storage buildings, overhead, and a charge or expenses incurred on wheat acreages abandoned and not harvested.

TABLE 458.—*Wheat, all: Cost of production, by regions, 1931*

Region	Acreage harvested	Production	Average yield per acre	Gross cost per acre: Prepare and plant	Harvest and thresh	Haul to market	Fertilizer and manure	Seed	Land rent	Miscellaneous[1]	Total	Credit per acre (straw)	Net cost per acre: Including rent	Excluding rent	Net cost per bushel: Including rent	Excluding rent
	1,000 acres	*1,000 bushels*	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Western Great Plains[2] (hard red spring wheat)	3,023	16,656	5.5	2.12	1.89	0.34	0.11	0.70	1.58	2.67	9.41	0.16	9.25	7.67	1.68	1.39
Eastern Great Plains (including Red River Valley)[3] (hard red spring wheat)	8,771	55,016	6.3	2.41	1.83	.34	.15	.94	2.60	2.64	10.81	.25	10.56	7.96	1.68	1.26
Great Lakes dairy[4] (hard red spring wheat)	943	20,210	21.4	4.16	3.69	.96	2.59	1.36	3.96	2.23	18.95	1.31	17.64	13.68	.82	.64
Western Great Plains[5] (hard red winter wheat)	12,030	184,325	15.3	1.89	1.88	.62	.02	.51	2.20	1.72	8.84	.10	8.74	6.54	.57	.43
Eastern Great Plains[6] (hard red winter wheat)	11,569	221,517	19.1	2.23	2.57	.68	.40	.67	3.12	1.74	11.41	.20	11.21	8.09	.59	.42
Central humid[7] (soft red winter wheat)	2,381	49,886	21.0	2.67	3.40	.94	1.66	.92	3.31	1.66	14.56	.77	13.79	10.48	.66	.50
Corn Belt[8] (hard and soft winter wheat)	5,027	123,480	24.6	2.81	3.70	.85	1.51	1.25	5.22	1.91	17.25	.73	16.52	11.30	.67	.46
Appalachian highlands and northeastern dairy[9] (soft red winter wheat)	4,137	98,900	23.9	3.98	4.28	1.23	3.77	1.44	4.30	2.23	21.23	2.62	18.61	14.31	.78	.60
Southeastern Cotton Belt[10] (soft red winter wheat)	697	10,193	14.6	3.31	3.46	1.01	2.44	1.25	4.19	1.80	17.46	1.23	16.23	12.04	1.11	.82
Southwestern Cotton Belt[11] (soft red winter wheat)	589	8,772	14.9	1.90	2.91	.79	.11	.84	3.02	1.64	11.21	.52	10.69	7.67	.72	.51
Rocky Mountain and Pacific coast[12] (common white wheat)	6,132	105,249	17.2	3.57	2.94	.74	.79	1.01	6.70	2.81	18.56	.79	17.77	11.07	1.03	.64
United States	55,299	894,204	16.2	2.57	2.61	.68	.78	.86	3.46	2.09	13.05	.54	12.51	9.05	.77	.58

Bureau of Agricultural Economics.

[1] Includes miscellaneous labor, irrigation (including water), seed treatment, sacks, and twine, crop insurance, use of implements, use of storage buildings, overhead, and a charge for expenses incurred on wheat acreages abandoned and not harvested.

[2] Includes the western portion of the northern Great Plains extending northwestward from western South Dakota into Montana and including a small portion of southwestern North Dakota, and a portion of northeastern Wyoming. A subhumid climate prevails.

[3] Includes the eastern portion of the northern Great Plains, including the Red River Valley in both South Dakota and Minnesota and extending northwestward from eastern South Dakota into North Dakota and northeastern Montana. A subhumid climate prevails.

[4] Includes Minnesota east of the Red River Valley, with Wisconsin and that part of Michigan lying north of the two southern tiers of counties. In Michigan soft red winter and white wheats prevail over the hard red spring wheat. A dairy type of farm prevails.

[5] Includes the western portion of the central Great Plains, including the panhandles of Texas and Oklahoma, the plains of eastern Colorado and western Kansas, eastern Wyoming, and western Nebraska. A subhumid climate prevails.

[6] Includes the eastern portion of the central Great Plains, including a small area in north-central Texas, and a broad band through central Oklahoma, central Kansas, and into Nebraska. A subhumid climate prevails.

[7] Includes Missouri from the tier of counties just north of the Missouri River south to the State line with adjacent parts of eastern Kansas, northeastern Oklahoma, and southwestern Illinois. A humid climate prevails.

[8] Includes the region of heavy corn production in Iowa, southeastern South Dakota, eastern Nebraska, southwestern Minnesota, northeastern Kansas, northern Missouri, northern Illinois, northern Indiana, western Ohio, and the two southern tiers of counties in Michigan.

[9] Includes the region of the Appalachian highland, including Kentucky, Virginia, West Virginia, and extending into southeastern Illinois, southern Indiana, eastern Ohio, with all of Pennsylvania, Maryland, Delaware, New Jersey, New York, and the very limited wheat acreage of the New England States.

[10] Includes the States of Tennessee, North Carolina, South Carolina, Georgia, and Alabama.

[11] Includes Arkansas, most of eastern Oklahoma, and Texas, with the exception of the panhandle, and the 12 counties included in the eastern Great Plains region.

[12] Includes the western portions of Montana, Wyoming, and Colorado, and the other States lying westward to the Pacific coast.

TABLE 459.—*Cotton: Cost of production, selected States, and regions, 1931*

State and region	Acreage harvested	Production of lint in 500-pound gross-weight bales	Average yield of lint per acre [1]	Gross cost per acre									Credit per acre (cottonseed)	Net cost of lint			
				Prepare and plant	Cultivate and hoe	Harvest [2]	Commercial fertilizer	Miscellaneous materials [3]	Ginning, including bags and ties	Land rent	Miscellaneous [4]	Total		Per acre		Per pound	
														Including rent	Excluding rent	Including rent	Excluding rent
STATE	*1,000 acres*	*1,000 bales*	*Pounds*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Cents*	*Cents*
North Carolina	1,333	756	284	4.05	4.08	5.17	3.83	1.80	1.77	4.99	2.94	29.32	2.74	26.58	21.59	9.4	7.6
South Carolina	1,060	1,005	256	3.51	4.47	4.47	3.16	2.03	1.45	3.39	2.94	25.42	2.49	22.93	19.54	9.0	7.6
Georgia	3,431	1,393	203	2.99	3.98	3.83	2.71	1.57	1.34	2.30	2.18	20.90	2.19	18.71	16.41	9.2	8.1
Alabama	3,397	1,420	209	2.99	4.60	3.59	2.31	1.53	1.50	3.13	2.16	21.81	2.03	19.78	16.65	9.5	8.0
Tennessee	1,115	595	267	3.28	4.15	5.07	1.37	1.84	2.16	3.92	2.08	23.87	2.02	21.85	17.93	8.2	6.7
Mississippi	4,032	1,761	218	3.00	4.53	4.62	1.28	1.42	1.84	5.24	2.35	24.26	2.05	22.21	16.97	10.2	7.8
Louisiana	1,958	900	230	2.74	5.00	4.47	.94	1.34	1.84	4.46	2.22	23.01	2.15	20.86	16.40	9.1	7.1
Arkansas	3,566	1,907	267	3.31	4.37	5.12	.96	1.49	2.47	4.65	2.11	24.48	2.06	22.42	17.77	8.4	6.7
Oklahoma	3,395	1,261	186	2.34	3.34	4.05	.03	1.01	2.29	3.63	1.27	17.96	1.59	16.37	12.74	8.8	6.8
Texas	15,469	5,322	172	2.42	3.04	3.40	.29	1.03	1.69	3.67	1.64	17.18	1.64	15.54	11.87	9.0	6.9
REGION																	
Coastal plain [5]	6,581	2,668	203	3.05	4.23	3.90	2.76	1.57	1.46	3.08	2.23	22.28	2.04	20.24	17.16	10.0	8.5
Piedmont [6]	3,629	1,731	238	3.53	4.59	4.30	2.72	1.74	1.41	3.12	2.89	24.30	2.40	21.90	18.78	9.2	7.9
Eastern hilly areas [7]	3,754	1,782	237	3.31	4.49	4.22	1.94	1.83	1.76	3.72	2.11	23.38	2.09	21.29	17.57	9.0	7.4
River-bottom areas [8]	4,064	2,363	291	2.74	5.02	6.14	.55	1.28	2.62	6.42	2.36	27.13	2.60	24.53	18.11	8.4	6.2
Western hilly areas [9]	7,437	3,001	202	2.97	4.09	4.11	.90	1.35	1.87	3.93	1.94	21.16	1.73	19.43	15.50	9.6	7.7
Gulf coast prairie and Texas black prairie [10]	6,708	2,583	193	2.50	3.21	3.63	.16	1.21	1.76	4.18	1.67	18.32	1.84	16.48	12.30	8.5	6.4
Western dry areas [11]	7,865	2,461	156	2.07	2.46	3.13	.04	.79	1.87	3.04	1.23	14.63	1.43	13.20	10.16	8.5	6.5
Irrigated areas [12]	639	495	388	5.09	4.44	7.48	....	1.55	4.53	12.50	8.54	44.19	4.27	39.92	27.36	10.3	7.1
United States [13]	40,077	17,084	210	2.83	3.83	4.09	1.12	1.33	1.85	3.95	2.05	21.05	1.96	19.09	15.14	9.1	7.2

Bureau of Agricultural Economics. Figures on production were compiled from reports on ginnings of the Bureau of the Census.

[1] Obtained by dividing the production of lint in terms of 500-pound gross-weight bales by the acreage harvested.
[2] Includes picking and snapping cotton, supervision of pickers, hauling to gin, and hauling lint and cottonseed to local markets.
[3] Includes manure, seed for planting, picking sacks, and sheets.
[4] Includes miscellaneous labor, irrigation (including water), dusting, crop insurance, use of implements, use of storage buildings, and overhead.
[5] Includes the lower and upper coastal plain of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, and the black prairie belt of Alabama and Mississippi.
[6] Includes the rolling and hilly uplands of Virginia, North Carolina, South Carolina, Georgia, and Alabama, which border the Blue Ridge Mountains on the east and south.
[7] Includes Tennessee exclusive of Lake County, the hilly cotton lands of northern Mississippi, northern Alabama, and northern Georgia, and western North Carolina.

[8] Include the principal bottom lands of the Mississippi, the Arkansas, and the Red Rivers.
[9] Include the hilly lands of Arkansas, Louisiana, southern Missouri, eastern Texas, and eastern Oklahoma.
[10] Includes the Gulf coast prairie of Texas and Louisiana, and the black waxy prairie of Texas.
[11] Include the dry-land areas of western Oklahoma, western Texas, and eastern New Mexico.
[12] Include the irrigated cotton lands of California, Arizona, New Mexico, and Texas.
[13] Weighted average cost for the 16 States of Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi, Louisiana, Arkansas, Missouri, Oklahoma, Texas, New Mexico, Arizona, and California, which produced 99.9 per cent of the United States cotton crops of 1929, 1930, and 1931.

TABLE 460.—*Corn: Cost of production by yield groups and geographical divisions, 1931*

Yield group (bushels per acre) and geographical division	Reports	Average acreage in corn per farm	Average yield per acre	Gross cost per acre: Prepare and plant	Gross cost per acre: Cultivate	Gross cost per acre: Harvest	Gross cost per acre: Market	Gross cost per acre: Fertilizer and manure	Gross cost per acre: Seed	Gross cost per acre: Land rent	Gross cost per acre: Miscellaneous [1]	Gross cost per acre: Total	Credit per acre (stover and fodder)	Net cost: Per acre	Net cost: Per bushel
	Number	*Acres*	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
All reports:															
7 and under	221	48	3	2.58	1.87	0.84	0.35	0.99	0.35	2.78	1.42	11.18	0.55	10.63	3.54
8 to 17	940	38	13	2.72	2.41	1.22	.84	1.44	.33	3.27	1.63	13.86	.67	13.19	1.01
18 to 27	1,448	31	22	3.13	2.56	1.70	1.30	2.02	.35	3.95	1.73	16.74	.91	15.83	.72
28 to 37	1,066	34	32	3.60	2.53	2.16	1.62	2.38	.35	4.76	1.94	19.34	1.20	18.14	.57
38 to 47	823	41	41	3.99	2.62	3.04	1.84	3.42	.40	5.53	2.25	23.09	1.62	21.47	.52
48 to 57	600	34	51	4.60	2.76	3.84	2.22	4.66	.44	5.62	2.45	26.59	2.35	24.24	.48
58 and over	316	23	69	4.88	3.05	4.78	2.96	6.44	.51	6.59	2.64	31.85	3.09	28.76	.42
Corn Belt: [2]															
17 and under	126	78	9	2.47	1.80	.97	.52	.84	.28	4.30	1.43	12.61	.58	12.03	1.34
18 to 27	177	60	23	2.64	1.67	1.55	1.04	1.21	.29	4.35	1.44	14.19	.60	13.59	.59
28 to 37	342	53	32	3.01	1.92	1.66	1.34	1.52	.31	4.94	1.62	16.31	.60	15.71	.49
38 to 47	319	69	41	3.27	1.95	2.12	1.38	1.37	.35	6.13	1.89	18.46	.70	17.76	.43
48 to 57	203	64	51	3.31	1.91	2.30	1.48	2.03	.36	6.52	1.83	19.74	.78	18.96	.37
58 and over	55	52	64	3.52	1.76	3.15	2.12	2.10	.36	6.57	1.75	21.33	1.02	20.31	.32
Total or average	1,222	63	35	3.04	1.87	1.88	1.29	1.47	.32	5.43	1.70	17.00	.67	16.33	.47
Geographical division:															
North Atlantic [3]	372	12	50	6.16	3.34	5.99	2.82	8.90	.59	5.41	3.23	36.44	4.12	32.32	.65
East North Central	1,090	36	41	4.03	2.43	3.14	1.66	3.44	.40	4.76	2.11	21.97	1.69	20.28	.49
West North Central	1,011	70	26	2.53	1.72	1.51	1.08	1.11	.30	4.68	1.52	14.43	.59	13.84	.53
South Atlantic	837	19	31	4.11	3.11	2.64	1.81	4.18	.40	4.63	2.23	23.11	2.15	20.96	.68
South Central	1,995	27	23	3.02	2.71	1.41	1.39	1.44	.35	4.04	1.70	16.06	.56	15.50	.67
Western	109	38	23	3.58	2.11	2.03	1.50	1.29	.41	6.60	2.81	19.73	1.73	18.00	.78
United States	5,414	35	30	3.53	2.56	2.31	1.54	2.71	.38	4.53	1.96	19.52	1.30	18.22	.61

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures by yield groups for 8 years 1923–1930, see Agriculture Yearbooks, 1924, p. 1135; 1925, p. 1332; 1926, p. 1213; 1927, p. 1139; 1928, p. 1044; 1930, p. 985; 1931, p. 1014; and 1932, p. 897. For figures by geographical divisions for 6 years, 1923–1930, see June issues of Monthly Supplement, Crops and Markets, 1924, p. 176; 1926, p. 180; 1926, p. 170; Crops and Markets, June issues, 1927, p. 202; 1928, p. 196; 1929, p. 202; 1930, p. 220; and 1931, p. 232.

[1] Includes miscellaneous labor, irrigation (including water), seed treatment, sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

[2] Corn Belt as used here includes Indiana, Illinois, Iowa, western Ohio, southeast corner of South Dakota, eastern Nebraska, northeast corner of Kansas, and the northern three-fourths of Missouri.

[3] Does not include reports from Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

TABLE 461.—*Oats: Cost of production by yield groups and geographical divisions, 1931*

Yield group (bushels per acre) and geographical division	Reports	Average acreage in oats per farm	Average yield per acre	Gross cost per acre: Prepare and plant	Gross cost per acre: Harvest and thresh	Gross cost per acre: Market	Gross cost per acre: Fertilizer and manure	Gross cost per acre: Seed	Gross cost per acre: Land rent	Gross cost per acre: Miscellaneous [1]	Gross cost per acre: Total	Credit per acre (straw)	Net cost: Per acre	Net cost: Per bushel
	Number	*Acres*	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
17 and under	386	30	10	2.55	1.95	0.44	0.83	0.98	3.22	1.74	11.71	0.60	11.11	1.11
18 to 22	338	20	20	2.84	2.96	.78	1.34	1.09	3.92	1.92	14.85	1.00	13.85	.69
23 to 27	313	19	25	2.88	3.12	.87	1.23	1.10	3.93	1.90	15.03	1.22	13.81	.55
28 to 32	598	25	30	2.69	3.25	1.00	1.24	1.09	4.34	2.06	15.67	1.15	14.52	.48
33 to 37	359	27	35	2.87	3.62	1.07	1.37	1.07	4.46	2.15	16.61	1.51	15.10	.43
38 to 42	626	24	40	2.84	3.84	1.16	1.19	1.12	4.87	2.11	17.13	1.50	15.63	.39
43 to 47	170	30	45	2.62	3.69	1.12	.98	.99	4.80	2.19	16.39	1.16	15.23	.34
48 to 52	365	27	50	2.92	4.03	1.31	1.14	1.09	5.00	2.38	17.87	1.25	16.62	.33
53 to 57	74	23	55	3.10	4.56	1.31	1.14	1.03	5.52	2.57	19.23	1.53	17.70	.32
58 to 62	125	26	60	2.77	4.44	1.45	1.03	1.12	5.56	2.44	18.81	1.52	17.29	.29
63 and over	114	24	73	3.00	5.21	1.69	1.45	1.19	5.45	2.68	20.67	1.50	19.17	.26
Geographical division:														
North Atlantic	386	12	35	5.30	4.86	1.30	2.76	1.51	4.81	3.03	23.57	2.93	20.64	.59
East North Central	949	24	39	2.90	3.51	1.04	1.20	.95	4.59	2.21	16.40	1.38	15.02	.39
West North Central	853	35	30	1.77	2.73	.82	.32	.89	4.56	1.72	12.81	.57	12.24	.41
South Atlantic	412	10	32	3.23	3.76	1.16	2.72	1.44	4.18	2.06	18.55	1.81	16.74	.52
South Central	666	27	36	2.04	3.43	1.07	.58	1.03	3.68	1.69	13.52	.59	12.93	.36
Western	197	36	33	3.51	3.20	1.17	.59	1.11	5.78	3.14	18.50	.97	17.53	.53
United States	3,463	25	35	2.79	3.45	1.03	1.18	1.08	4.46	2.11	16.10	1.23	14.87	.42

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. For figures by yield groups for 8 years, 1923–1930, see Agriculture Yearbooks, 1924, p. 1187; 1925, p. 1385; 1926, p. 1217; 1927, p. 1143; 1928, p. 1048; 1930, p. 986; 1931, p. 1015; and 1932, p. 898. For figures by geographical divisions for 8 years, 1923–1930, see June issues of Monthly Supplement, Crops and Markets, 1924, p. 176; 1925, p. 180; 1926, p. 170; Crops and Markets, June issues, 1927, p. 202; 1928, p. 190; 1929, p. 202; 1930, p. 220; and 1931, p. 232.

[1] Includes miscellaneous labor, irrigation (including water), seed treatment, sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*

This table presents some results, in terms of averages per farm, from most of the farm-business studies that have been made in the United States west of the Mississippi River from 1924 to 1931. The table is a supplement to Table 652, pp. 1285 to 1311, Agriculture Yearbook, 1925, and Table 526, pp. 984 to 1012, Agriculture Yearbook, 1931. Data prior to 1924 for a few localities were omitted from Table 652 (1925) and are included here. The data for 1924 in certain localities were published in Table 652 (1925) and those for other localities in this table.

The data presented were compiled from figures obtained directly from farmers, by the Bureau of Agricultural Economics, U. S. Department of Agriculture, by the State colleges of agriculture or agricultural experiment stations, or by the Bureau of Agricultural Economics cooperating with the State colleges of agriculture or the agricultural experiment stations. They include those obtained through research projects, extension projects, or joint research and extension projects, and whether obtained by the survey method or from records or farm account books kept by farmers. In this table a larger percentage of the data are from records or farm account books kept by farmers than in Table 652 (1925).

EXPLANATION OF TERMS

Interpretation of the terms used in this table is essentially in accord with their use in Farmers' Bulletin No. 1139, A Method of Analyzing the Farm Business. They are briefly described as follows:

Year covered by study.—In many instances the year is not the calendar year, but the farm year as determined by the project leader. When not a calendar year, the year given is that in which the crops were usually harvested. Thus, 1929 may mean the calendar year 1929 or from Mar. 1 or Apr. 1, 1929, to Feb. 28 or Mar. 31, 1930. There has been a tendency in late years to make the farm year correspond to the calendar year.

Size of farms: Total.—The acreage of land operated as one farm or unit. All, or practically all, of the area is operated by one set of machinery, horses, workmen, etc. The farm may consist of all-owned, all-rented, or both owned and rented land. When two or more farms are owned by the same person, or persons, but operated rather independently of each other, they are considered separate farms.

Size of farms: Crops.—The acreage in fruits, tilled, intertilled, and hay crops. Does not include pasture except annual crops when used as pasture. If more than one crop is grown on any of the land during the year, the acreage is counted but once in computing the acres in crops.

Capital: Total.—The value of all real estate, machinery, livestock, and other property used to carry on the year's business. It usually includes the value of the farm dwelling, but not of the household furnishings.

Capital: Real estate.—The value of the farm, including buildings, fences, and water supply.

Receipts.—Proceeds from the sale of crops produced during the farm year, the increase from livestock, and the receipts from work off the farm, rent of buildings, etc. The increase from livestock is found by subtracting the sum of the amount paid for livestock purchases and the inventory value at the beginning of the year from the sum of the receipts from livestock products, sales of livestock, and the inventory value at the end of the year. Receipts do not include the family living from the farm. Differences in method of calculating receipts and expenses employed in the original computations of the data for some of the studies have been eliminated in many instances when the data were assembled for this table. For the occasional study in which it was impracticable to eliminate these differences, receipts and expenses as shown may be slightly higher or lower than they should be in order to be strictly comparable with those for the other studies. In a table of this sort, where only averages for a study are given, these differences are rarely of more than minor significance as they affect the receipts and expenses, and there is no difference in the farm income.

Expenses.—Annual expenditures made in carrying on the farm business. They include depreciation on buildings and equipment, and the unpaid labor performed by members of the farm family, but do not include the farmer's own labor or any household and personal expenses.

Farm income.—The difference between receipts and expenses. It does not include the family living from the farm.

Family income.—The farm income plus other unpaid family labor.

Labor income.—Farm income less 5 per cent interest charge for the use of the capital. It does not include the family living from the farm. In some of the studies, as originally published, other rates of interest were used. In certain localities the unpaid family labor was not obtained. In those localities with no entries for farm income, expenses, and labor incomes are not comparable with those in the other localities with entries for farm income. Had other unpaid family labor been obtained, expenses would have been higher and labor incomes lower than reported by the amount of this item. In these cases the figure carried in the labor-income column is family labor income and not operator's labor income.

Return to capital.—The rate returned to the capital after the estimated value of the farmer's labor is deducted from the farm income. (See "Farmer's labor," below.)

Family living from the farm.—The food products set aside from the year's production and the fuel and house rent furnished by the farm for the living of the farm family. This is in addition to receipts, farm income, and labor income.

Operator's earnings.—Labor income plus family living from the farm.

Farmer's labor.—An allowance for the farmer's own labor and management at the rate he would have to pay another man to take his place. It does not include the family living from the farm.

Other unpaid family labor.—The unpaid family labor other than the labor of the farmer himself determined on the basis of what it would cost to have the same work done by hired labor or on the amount of additional labor that would need to be hired to carry on the same sized business if the family labor had not been available.

Principal sources of receipts.—These are named in order of importance and in most instances include enough enterprises to amount to 75 per cent or more of the total receipts. Under this heading cotton includes sales of cottonseed; poultry includes sales of eggs; sheep includes lambs and wool; horses include mules and colts; work includes man, man and team, and machine work which the farmer did off the farm for hire; wood includes sales of timber, lumber, posts, firewood, etc. Cattle does not include sales of dairy products. In some instances receipts were grouped as crops, livestock, miscellaneous, and are not available in such detail of enterprises as just indicated.

Specific exceptions to the above explanations of terms are indicated by references to footnotes at end of the table.

Key.—The numbers indicate the agency which obtained the data, and the letters following the method used in obtaining the data, as follows:

1.—Bureau of Agricultural Economics, U. S. Department of Agriculture.

2.—State college of agriculture or agricultural experiment station.

3.—Bureau of Agricultural Economics, U. S. Department of Agriculture in cooperation with State college of agriculture or agricultural experiment station.

S—Farm business survey.

R—Records, or farm account books.

Thus a study with key 3R means the data were obtained by the Bureau of Agricultural Economics, U. S. Department of Agriculture, in cooperation with the State college of agriculture or agricultural experiment station, and they were taken from records or farm account books kept by the farmers.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key *	Principal sources of receipts	Year covered by study	Farms included	Size of farms: Total	Size of farms: Crops	Capital: Total	Capital: Real estate	Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Per ct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Arizona:																		
Graham	2S	Cattle, poultry, cotton	1925	21	122	70	16,693	13,893	5,163	[1] 2,359		2,804	[2] 1,969		527	2,496		
Maricopa—Salt River Valley.	3S	Cotton, dairy, lettuce, wheat, alfalfa hay, poultry, cantaloupes.	1927	143	110		29,548	26,114	8,545	5,538	3,007	3,186	1,530	6.7			1,022	179
All counties except Yuma—cattle ranches.	3R	Cattle	1925	86			118,852	42,558	32,479	20,098	12,381	12,445	6,438	10.0			550	64
Arkansas:																		
Arkansas, Lonoke, Prairie—rice farms.	2S	Rice	1927	92	327	210	27,743	24,453	8,078	[1] 4,568		3,510	[2] 2,123					
Benton, Washington, others.	3R	Dairy, poultry, apples, strawberries, cattle, grapes.	1923	24	112		8,403	6,796	1,772	1,289	483		63					
Do	3R	Dairy, apples, poultry, strawberries, grapes, cattle.	1924	26	136		11,990	10,169	2,519	1,378	1,141		541					
Do	3R	Dairy, poultry, apples, stawberries, cattle, grapes.	1925	33	99		8,772	7,223	1,695	968	727		288					
Chicot, Faulkner, Pope.	3R	Cotton	1914	53	93	44	4,140	2,760	873	585	283	354	81	−.3			302	66
Crawford, Faulkner, Pulaski, Sebastian, others.	3R	Cotton, sweetpotatoes, dairy, strawberries, poultry.	1923	47	125		5,668	4,452	955	624	331		48					
Do	3R	Cotton, dairy, sweetpotatoes, poultry, strawberries.	1924	67	125		6,014	4,915	1,296	641	655		354					
Do	3R	do	1925	60	125		6,122	4,629	1,577	860	717		411					
Faulkner	2S	Cotton, livestock, fruits, and vegetables.	1924	261	96	38	3,653	3,004	1,161	582	579	744	396		482	878		195
Do	2S	do	1925	219	88	38	3,282	2,626	1,023	570	453	657	289		492	781		204
Do	2S	do	1926	259	85	41	3,014	2,304	788	543	245	426	94		580	674		181
Hempstead, Miller, Nevada.	3S	Cotton, dairy, sweetpotatoes, poultry, strawberries.	1926	60	138		5,262	4,329	1,689	1,009	680	811	417					131
Do	3S	Cotton, sweetpotatoes, poultry, dairy.	1927	60	131		5,518	4,531	1,597	792	805	957	529					152
Washington	3S	Apples	1916	50	73	55	10,560	9,060	1,687	1,043	644	740	116		356	472		96
Do	3S	do	1917	49	75	55			3,535	1,534	2,001	2,079			396			78
Do	3S	do	1918	50	74	57			2,650	1,764	886	979			486			93
Do	3S	do	1919	49	65	48	9,214	7,495	5,954									
Do	3S	Grapes, strawberries, apples, dairy, work, poultry, cattle, blueberries, hogs, wood.	1929	78	131	70	16,479	15,083	3,111	2,545	566	775	−258	−.1	494	236	586	209

Colorado:																			
Cheyenne, Lincoln, and others—prairie cattle ranches.	3R	Cattle	1922	11			81,265		12,999	[1] 9,232		3,767	[2] −296	4.1			427	
Do.	3R	do.	1923	16			99,815		11,110	[1] 8,450		2,660	[2] −2,321	2.1			588	
Do.	3R	do.	1924	16			100,956		10,114	[1] 7,998		2,116	[2] −2,932	1.4			743	
Do.	3R	do.	1925	15			104,947		13,720	[1] 10,021		3,699	[2] −1,548	2.8			750	
Do.	3R	do.	1922–1925	58	5,279	187	98,002	57,051	10,942	[1] 7,953		2,989	[2] −1,911	2.4			642	
Delta	2R	Apples, dairy, cattle, beets	1926	25	89	60	14,397	11,080	4,464	3,320	1,144	1,505	424	3.8	303	727	600	361
Do.	2R	Apples, dairy, cattle	1927	23	119	62	16,068	12,184	5,877	3,811	2,066	2,355	1,263	9.2	302	1,565	580	289
Do.	2R	Apples, dairy, beets	1928	22	106	59	15,074	11,229	5,008	3,394	1,614	1,745	860	7.0	299	1,150	562	131
Do.	2R	Apples, dairy	1929	20	106	54	14,415	10,376	4,901	3,864	1,037	1,201	316	3.2	338	654	576	164
Do.	2R	Apples, sheep, beets	1930	12	311	77	16,174	11,092	2,916	2,994	−78	−18	−887	−4.2	254	−633	600	60
Do.	2R	Beets, dairy, sheep, onions	1931	14	140	70	12,579	9,043	1,690	2,264	−574	−497	−1,203	−8.7	218	−985	515	87
Dryland Plains counties—																		
Lincoln, Logan, Washington, Weld.	2R	Wheat, cattle, hogs, poultry	1927	40	884	377	15,932	11,856	4,188	2,356	1,832	1,923	1,035	7.1	309	1,344	702	91
Do.	2R	do.	1928	23	866	349	14,280	10,218	3,747	2,336	1,411	1,528	697	4.6	268	965	751	117
Lincoln, Logan, Sedgwick, Washington, Weld.	2R	do.	1929	29	844	422	14,581	12,665	3,936	2,778	1,158	1,389	429	2.7	259	688	757	231
Kiowa, Las Animas, Lincoln, Logan, Sedgwick, Washington, Weld.	2R	Wheat, cattle, hogs	1930	22	704	334	17,596	13,121	2,815	2,347	468	688	−412	−1.3	270	−133	704	220
Arapahoe, Kiowa, Las Animas, Lincoln, Logan, Sedgwick, Washington, Yuma.	2R	Cattle, corn, poultry	1931	29	842	362	14,680	9,984	1,685	2,370	−685	−534	−1,419	−8.7	228	−1,191	594	151
Fremont	2R	Celery, fruit, oats	1925	15	156	48	11,123	9,367	2,653	1,439	1,214	1,221	658	5.5	365	1,023	600	7
Do.	2R	Fruit, squash	1926	16	97	43	9,806	9,428	2,640	1,407	1,233	1,257	743	8.5	328	1,071	600	54
Do.	2R	Poultry, apples, dairy	1927	21	104	36	9,852	8,028	2,898	1,730	1,168	1,209	675	5.8	300	975	600	41
Do.	2R	Dairy, cattle, apples	1928	19	110	39	10,080	9,510	2,954	1,724	1,230	1,331	726	6.6	281	1,007	564	101
Do.	2R	Dairy, vegetables	1929	18	109	41	10,956	8,455	2,817	1,915	902	974	354	3.2	284	638	554	72
Do.	2R	Vegetables, beans	1930	12	86	45	10,011	7,717	2,118	1,877	241	283	−260	−2.9	262	2	535	42
Grand	2R	Cattle, dairy, lettuce	1926	15	835	174	19,868	15,317	3,524	1,577	1,947	2,198	953	6.7	370	1,323	609	251
Do.	2R	Cattle, sheep	1927	11	923	141	22,591	15,650	3,853	1,530	2,323	2,483	1,193	7.2	355	1,548	690	160
Do.	2R	do.	1928	10	943	147	22,618	13,783	4,553	2,157	2,396	2,712	1,265	7.4	384	1,649	732	316
Do.	2R	Cattle, dairy, lettuce	1929	9	1,041	139	24,304	14,037	1,721	2,138	−417	−141	−1,632	−4.7	379	−1,253	733	276
Do.	2R	Cattle, sheep	1930	9	1,034	145	22,849	15,181	1,220	2,079	−859	−598	−2,001	−7.0	301	−1,700	733	261
Do.	2R	Cattle, dairy, hay	1931	8	1,131	155	21,978	15,829	1,000	2,338	−1,338	−1,017	−2,437	−8.3	247	−2,190	455	321
Jackson	3R	Cattle	1929	19	3,442	1,055	79,463	35,926	15,573	9,351	6,222	6,354	2,249	6.6			998	132
Do.	3R	do.	1930	19	3,850	1,057	81,032	36,701	9,407	12,456	−3,049	−2,950	−7,101	−5.1			1,068	99
Do.	3R	do.	1931	18	3,998	1,081	78,319	37,395	7,455	14,322	−6,867	−6,788	−10,783	−9.8			823	70

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms		Capital		Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
					Total	Crops	Total	Real estate										
				No.	Acres	Acres	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Per ct.	Dolls.	Dolls.	Dolls.	Dolls.
Colorado—Continued. Jackson, Saguache, and others—mountain cattle ranches.	3R	Cattle	1922	18										1.8				
Do.	3R	do.	1923	22										2.2				
Do.	3R	do.	1924	27										2.8				
Do.	3R	do.	1925	27										4.2				
Do.	3R	do.	1922–1925	94	3,932	1,056	104,567	62,623	14,244	[1] 10,781		3,463	[2] −1,765	2.7			597	
Mesa—Grand Junction district.	2R	Pears, apples	1926	30	33	26	9,987	7,900	2,825	2,702	123	421	−376	−4.8	294	−82	600	298
Do.	2R	Pears, dairy, cattle, poultry	1927	30	162	35	13,202	9,019	4,702	3,075	1,627	1,928	967	8.2	327	1,294	550	301
Do.	2R	Dairy and cattle	1928	26	47	37	11,304	7,695	4,167	2,938	1,229	1,384	664	5.9	318	982	564	155
Do.	2R	Dairy, pears, apples	1929	18	38	27	12,643	8,209	5,680	4,085	1,595	1,755	963	8.1	332	1,295	573	160
Do.	2R	Dairy, poultry	1930	12	42	30	13,437	8,213	4,272	3,602	670	737	−2	.7	260	258	581	67
Do.	2R	Dairy, apples, pears	1931	10	47	29	14,190	9,086	3,721	3,910	−189	−111	−899	−6.3	225	−674	699	78
Mesa—Palisade district.	2R	Peaches	1927	14	16	13	20,926	18,982	6,652	3,866	2,786	2,850	1,740	10.6	107	1,847	561	64
Do.	2R	Peaches, dairy	1928	10	19	17	19,455	17,975	3,092	2,356	736	736	−237	1.1	147	−90	522	
Do.	2R	Peaches, dairy, pears	1929	6	17	16	20,619	18,592	7,082	3,276	3,806	3,806	2,775	16.3	110	2,885	450	
Do.	2R	Peaches, dairy	1930	6	17	16	20,694	18,592	5,183	3,377	1,806	1,806	771	6.0	94	865	450	
Do.	2R	Peaches, apricots, pears	1931	8	16	15	21,211	19,444	2,872	2,870	2	2	−1,059	−2.7	56	−1,003	572	
Moffat	2R	Wheat, cattle	1926	49	483	76	8,955	7,191	1,402	730	672	809	224	1.6	321	545	533	137
Do.	2R	Cattle, dairy, wheat	1927	34	581	119	9,534	7,449	2,000	944	1,056	1,252	579	4.9	284	863	585	196
Do.	2R	Cattle, dairy, wheat, poultry	1928	32	654	129	10,247	7,609	1,876	1,060	816	968	304	2.5	309	613	555	152
Do.	2R	Dairy, cattle, wheat, hogs	1929	23	651	123	10,637	7,639	1,771	1,096	675	783	143	1.0	372	515	572	108
Do.	2R	Dairy, cattle, sheep	1930	19	766	141	11,217	8,124	1,020	1,072	−52	1	−613	−5.8	340	−273	598	53
Do.	2R	Wheat, dairy, hogs	1931	13	662	142	11,051	8,045	897	1,188	−291	−192	−844	−6.5	353	−491	428	99
Montrose	2R	Potatoes, apples	1926	27	138	90	16,983	11,722	5,428	3,372	2,056	2,212	1,257	9.1	388	1,045	600	156
Do.	2R	Potatoes, onions	1927	24	150	95	15,586	11,854	3,947	2,524	1,423	1,576	644	5.3	350	994	596	153
Do.	2R	Onions, dairy, cattle	1928	24	141	91	15,411	10,542	5,119	3,323	1,796	1,928	1,025	8.0	386	1,411	559	132
Do.	2R	Potatoes, dairy, cattle, hogs	1929	22	145	81	15,469	10,364	5,061	3,211	1,850	2,028	1,077	8.4	374	1,451	553	178
Do.	2R	Potatoes, dairy, cattle, sheep, hogs.	1930	19	210	85	15,265	9,723	3,289	3,730	−441	−426	−1,204	−8.1	310	−894	801	15
Do.	2R	Dairy, onions, hogs	1931	6	202	65	11,195	7,344	1,868	1,866	2	72	−558	−5.0	211	−347	565	70
Otero	2R	Cattle, beets, hogs	1921	25	91	69	19,175	16,281	3,525	2,459	1,066	1,218	107	2.4	249	356	600	152
Do.	2R	Dairy, beets, hogs	1922	25	102	74	19,454	15,018	3,422	2,694	728	945	−245	.7	355	110	600	217
Do.	2R	Beets, cattle	1923	42	99	74	15,318	12,308	2,742	2,400	342	625	−424	−1.7	269	−155	600	283
Do.	2R	Cattle, dairy, beets, hogs	1924	41	109	80	14,499	12,014	4,394	2,530	1,864	2,021	1,139	8.7	304	1,443	600	157
Do.	2R	Cattle, dairy, poultry, beets	1925	40	116	83	12,736	9,617	4,031	2,734	1,297	1,415	660	5.5	293	953	600	118
Do.	2R	Cattle, dairy, beans, beets	1926	31	133	100	13,028	10,406	4,453	2,432	2,021	2,096	1,370	10.9	308	1,678	600	75

Do.	2R	Cattle, dairy, beets, cantaloupes.	1927	30	173	112	13, 188	10, 087	5, 121	2, 914	2, 207	2, 295	1, 548	12. 2	330	1, 878	600	88
Do.	2R	Beets, sheep, alfalfa	1928	28	156	113	14, 792	10, 820	5, 781	3, 264	2, 517	2, 911	1, 777	13. 1	314	2, 091	582	394
Do.	2R	Cattle, dairy, onions, beets	1929	27	141	101	13, 059	8, 642	5, 586	3, 774	1, 812	1, 867	1, 159	9. 4	302	1, 461	588	55
Do.	2R	Beets, cattle, dairy, beans	1930	25	136	96	12, 250	7, 943	5, 280	3, 505	1, 775	1, 783	1, 163	9. 8	275	1, 438	573	8
Do.	2R	Beets, cattle, dairy, onions	1931	26	133	99	11, 245	7, 252	3, 527	3, 161	366	375	−196	−1. 9	245	49	577	9
Routt	2R	Cattle, sheep, wheat, oats	1926	34	476	141	19, 788	14, 931	3, 209	1, 721	1, 488	1, 682	499	5. 6	425	924	370	194
Do.	2R	Cattle, sheep	1927	22	518	147	23, 072	16, 819	4, 749	2, 042	2, 707	2, 848	1, 553	8. 6	422	1, 975	720	141
Do.	2R	Cattle, sheep, hogs, poultry	1928	21	535	174	24, 923	16, 890	4, 884	2, 142	2, 742	2, 894	1, 496	7. 9	446	1, 942	782	152
Do.	2R	Cattle, dairy, hogs, oats, potatoes.	1929	15	574	163	28, 747	17, 856	3, 186	2, 338	848	997	−589	. 5	470	−119	694	149
Do.	2R	Cattle, dairy, hogs, poultry	1930	10	460	157	23, 291	16, 230	1, 846	2, 172	−326	−289	−1, 491	−4. 3	363	−1, 128	666	37
Do.	2R	Cattle, dairy, hogs, sheep	1931	13	755	212	24, 681	18, 122	1, 530	2, 449	−919	−807	−2, 153	−6. 1	356	−1, 797	585	112
San Miguel	2R	Sheep, cattle, dairy; hogs	1926	22	1, 680	90	21, 430	13, 864	5, 271	2, 731	2, 540	3, 061	1, 468	9. 0	336	1, 804	600	521
Do.	2R	Cattle, sheep, hogs	1927	21	1, 225	95	21, 424	11, 621	6, 692	2, 558	4, 134	4, 439	3, 063	16. 5	303	3, 366	600	305
Do.	2R	Cattle, sheep	1928	20	1, 854	107	26, 830	14, 041	7, 679	3, 150	4, 529	4, 776	3, 187	14. 7	362	5, 549	591	247
Do.	2R	Sheep, cattle	1929	15	2, 213	126	33, 001	17, 719	5, 799	3, 779	2, 020	2, 178	370	4. 4	361	731	577	158
Do.	2R	do	1930	13	2, 053	127	28, 086	15, 605	3, 487	2, 874	613	736	−691	−. 9	355	−336	842	123
Do.	2R	do	1931	11	2, 227	119	25, 446	13, 603	500	4, 214	−3, 714	−3, 626	−4, 986	−17. 4	299	−4, 687	712	88
Weld	3R	Sheep, cattle, beets, potatoes	1922	20	156	127	28, 824	19, 994	10, 350	9, 776	574	719	−617	−1. 6	336	−281	948	145
Do.	3R	do	1923	22	180	142	24, 822	21, 025	13, 357	10, 232	3, 125	3, 362	1, 884	8. 9	358	2, 242	926	237
Do.	3R	do	1924	20	172	151	29, 880	25, 330	16, 879	13, 142	3, 737	3, 985	2, 243	9. 7	333	2, 576	832	248
Do.	3R	Sheep, cattle, beets, potatoes, beans.	1925	22	163	144	31, 983	26, 092	18, 243	15, 897	2, 346	2, 538	747	4. 3	325	1, 072	963	192
Do.	3R	Sheep, cattle, beets, potatoes	1926	21	163	151	31, 253	23, 716	14, 372	10, 011	4, 361	4, 537	2, 798	10. 3	339	3, 137	1, 127	176
Do.	3R	do	1927	17	154	142	32, 512	25, 222	16, 988	14, 248	2, 740	2, 813	1, 114	6. 0	355	1, 469	801	73
Do.	3R	do	1928	16	148	135	32, 549	26, 577	13, 965	13, 469	496	548	−1, 131	−1. 1	263	−868	854	52
Do.	3R	do	1929	18	159	140	32, 582	26, 404	17, 927	18, 071	−144	60	−1, 773	−3. 5	285	−1, 488	995	204
Do.	3R	do	1930	18	149	130	30, 309	23, 358	13, 647	11, 637	2, 010	2, 193	495	−3. 8	295	790	873	183
Do.	2R	do	1931	24	150	128	26, 310	20, 540	5, 773	5, 612	161	237	−1, 155	−1. 9	233	−922	650	76
Idaho:																		
Bonnerville	2R	Potatoes, beets, peas, hogs, dairy.	1930	12	92	72	21, 328	18, 000	5, 377	3, 686	1, 691	1, 850	625	-----	-----	-----	-----	159
Cassia, Minidoka	3S	Potatoes, livestock, grain, dairy, seed crop, sugar beets, hay, poultry, beans, and peas.	1925	109	97	69	14, 759	12, 179	6, 339	[1] 2, 104	-----	4, 235	[1] 3, 497	-----	-----	-----	-----	-----
Franklin	2S	Dairy, beets, wheat, poultry, peas, alfalfa.	1929	22	105	82	17, 959	13, 400	4, 748	1, 926	2, 822	2, 937	1, 924	-----	-----	-----	-----	115
Jefferson	2R	Dairy, peas, hogs, beets, poultry, wheat, alfalfa.	1929	32	97	76	12, 762	9, 358	4, 490	1, 486	3, 004	3, 161	2, 366	-----	-----	-----	-----	157
Jerome	2R	Beans, alfalfa, potatoes, wheat, dairy, sheep.	1929	18	164	131	30, 807	27, 107	11, 683	5, 459	6, 224	6, 462	4, 684	-----	-----	-----	-----	258
Minidoka	2R	Potatoes, beets, dairy, beans, sheep, hogs.	1930	20	65	54	12, 875	10, 175	3, 415	2, 116	1, 299	1, 366	655	-----	-----	-----	-----	67
Twin Falls	2R	Beans, beets, dairy, wheat, sheep, apples, potatoes.	1929	46	104	95	28, 280	25, 165	8, 360	2, 839	5, 521	5, 652	4, 107	-----	-----	-----	-----	131
Iowa: [3]																		
Boone, Calhoun, Greene, Webster.	2R	Hogs, cattle, poultry	1931	105	228	186	45, 010	36, 908	2, 353	3, 249	-----	−896	−2, 637	-----	-----	-----	-----	-----

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms		Capital		Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
					Total	Crops	Total	Real estate										
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Perct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Iowa—Continued.																		
Butler, Franklin,	2R	Hogs, dairy, cattle, poultry	1929	127	252	169	45,413	37,044	7,307	4,002		3,305	230					
Grundy, Hardin.				7														
Do	2R	Hogs, dairy, poultry, cattle	1930	178	235	166	44,029	34,310	5,248	4,081		1,167	−1,731					
Do	2R	Hogs, dairy, poultry	1931	104	264	182	43,180	32,813	3,250	5,110		−1,860	−3,957				600	
East-central region—meat.	2R		1928	11									282					
Do	2R	Hogs, cattle, dairy, poultry	1929	139	214	145	47,751	39,162	7,760	5,011		2,749	508					
Do	2R	Hogs, cattle, dairy	1930	194	216	147	43,473	35,208	5,491	4,634		857	−1,195					
Do	2R	Hogs, dairy, poultry	1931	147	227	154	40,290	31,559	3,296	4,178		−882	−2,462					
North-central region—cash grain.	2R		1928	131								2,552	848					
Do	2R	Hogs, grain, cattle, dairy, poultry, sheep.	1929	258	213	160	42,952	35,145	7,074	3,933		3,141	758					
Do	2R	Hogs, cattle, dairy	1930	296	213	160	41,485	32,802	4,837	4,231		606	−1,437					
Do	2R	Hogs, dairy, poultry, cattle	1931	264	230	177	40,790	32,448	2,870	3,830		−960	−2,785					
Northeast region—dairy.	2R		1928	74									368					
Do	2R	Hogs, dairy, poultry, cattle, sheep.	1929	113	175	114	26,847	21,525	4,738	2,405		2,333	377					
Do	2R	Hogs, dairy, cattle	1930	93	195	127	31,151	24,375	4,078	3,275		803	−1,164					
Do	2R	Hogs, dairy, poultry	1931	82	207	132	30,610	22,936	2,743	3,450		−707	−2,416					
Southern region—pasture.	2R		1928	92									159					
Do	2R	Hogs, cattle, dairy, poultry, sheep.	1929	84	237	134	35,308	28,440	5,759	3,558		2,201	183					
Do	2R	Hogs, cattle, dairy	1930	74	234	136	33,614	26,676	4,652	3,710		942	−1,072					
Do	2R	Hogs, dairy, poultry, cattle	1931	85	226	131	30,510	23,346	2,682	3,278		−596	−2,249					
Western region—meat	2R		1928	40									538					
Do	2R	Hogs, cattle, dairy	1929	56	204	140	45,967	37,128	7,350	4,452		2,898	710					
Do	2R	do	1930	48	206	148	42,524	33,372	5,456	4,456		1,000	−1,196					
Do	2R	do	1931	73	207	149	37,210	28,938	3,018	3,574		−556	−2,523					
State	2R		1926	238									411					
Do	2R		1927	394									−160					
Do	2R		1928	451									458					
Do	2R	Hogs, cattle, dairy	1929	650	209	144	40,447	32,813	6,702	3,928		2,774	560					
Do	2R	do	1930	705	213	147	39,913	31,737	4,957	4,194		763	−1,280					
Do	2R	Hogs, dairy, poultry, cattle	1931	651	223	157	37,650	29,416	2,971	3,789		−818	−2,607					
Webster	3R		1928	25	186	144	34,861	27,781	5,437	2,163		3,274	1,794				805	165
Do	3R	Hogs, cattle, corn, oats, dairy	1929	39	190	150	36,381	28,988	7,433	4,305		3,128	1,272				862	124
Do	3R	do	1930	49	182	150	37,496	28,885	5,858	5,224		634	−504				864	136

Kansas:																		
Bourbon	3R	Dairy, cattle, hogs, poultry, eggs.	1925	15	219	110	15,576	12,197	3,320	2,047	1,273	1,565	494	4.7	425	919	540	292
Do	3R	do	1926	15	242	115	16,003	12,227	3,757	2,616	1,141	1,432	341	3.8	422	763	540	291
Jackson	3R	Hogs, cattle, poultry, dairy, wheat, corn.	1920	22	294	130	40,325	32,638	6,981	5,556	1,425	1,573	−591	2.2	476	−115	540	148
Do	3R	do	1921	21	231	150	33,292	26,511	4,450	5,496	−1,046	−888	−2,711	−4.7	369	−2,342	540	158
Do	3R	do	1922	14	226	166	29,684	24,156	5,476	4,361	1,115	1,338	−369	1.9	459	90	540	223
Do	3R	do	1923	16	209	150	29,801	24,184	5,198	4,155	1,043	1,217	−447	1.7	427	−20	540	174
Do	3R	Hogs, cattle, poultry, dairy, corn.	1924	17	183	129	25,600	20,597	5,919	4,594	1,325	1,485	45	3.1	512	557	540	160
McPherson	3R	Wheat, cattle, hogs, poultry, dairy.	1920	19	306	186	31,691	24,826	5,356	4,288	1,068	1,304	−517	1.7	433	−84	540	236
Do	3R	do	1921	19	325	255	26,960	21,360	4,113	4,609	−496	−350	−1,844	−3.8	413	−1,431	540	146
Do	3R	do	1922	18	295	251	26,552	21,836	3,943	2,693	1,250	1,436	−78	2.7	478	400	540	186
Do	3R	Wheat, cattle, poultry, hogs, dairy.	1923	19	277	231	26,089	21,826	2,650	2,886	−236	−119	−1,540	−3.0	425	−1,115	540	117
Do	3R	Wheat, dairy, poultry, hogs, cattle.	1924	18	269	226	23,158	18,829	4,139	2,103	2,036	2,134	878	6.5	470	1,348	540	98
North-central wheat and livestock area.																		
Clay	2R	Cattle, poultry, hogs, wheat	1931	11	303	191	[4] 20,181	[4] 7,668	1,937	2,244	−307	−226	−1,316	−3.6	[5] 256	−1,060	420	81
Cloud	2R	Wheat, cattle, poultry, hogs, dairy.	1931	14	214	154	[4] 17,276	[4] 11,106	1,856	1,405	451	485	−413	.2	[5] 286	−127	420	34
Riley	2R	Cattle, poultry, hogs, dairy, wheat.	1931	18	345	143	[4] 24,781	[4] 18,130	2,674	2,463	211	343	−1,028	−.8	[5] 341	−687	420	132
Washington	2R	Hogs, dairy, poultry, cattle, wheat.	1931	17	318	178	[4] 26,733	[4] 17,695	2,824	3,627	−803	−702	−2,140	−4.6	[5] 217	−1,923	420	101
Total or average	2R	Wheat and livestock	1931	60	299	164	[4] 22,740	[4] 14,450	2,391	2,506	−115	−24	−1,252	−2.4	[5] 277	−975	420	91
South-central wheat and livestock area.																		
Cowley	2R	Cattle, wheat, hogs, poultry	1931	20	302	177	[4] 16,007	[4] 9,875	2,117	2,259	−142	−36	−942	−3.5	[5] 250	−692	420	106
Harper	2R	Wheat, dairy, hogs, poultry, cattle.	1931	23	448	341	[4] 24,312	[4] 11,385	3,136	2,349	787	823	−429	1.5	[5] 300	−129	420	36
Kingman	2R	Wheat, hogs, dairy, poultry, cattle.	1931	34	537	330	[4] 23,778	[4] 16,478	2,334	2,143	191	248	−998	−1.0	[5] 371	−627	420	57
Sedgwick	2R	Dairy, wheat, poultry, cattle, hogs.	1931	19	250	184	[4] 19,333	[4] 12,982	2,435	2,227	208	290	−759	−1.1	[5] 244	−515	420	82
Sumner	2R	Dairy, wheat, hogs, poultry, cattle.	1931	23	369	258	[4] 18,927	[4] 12,828	2,640	2,400	240	320	−706	−1.0	[5] 275	−431	420	80
Total or average	2R	Wheat and livestock	1931	119	402	269	[4] 20,928	[4] 13,120	2,327	2,265	262	332	−784	−.8	[5] 298	−486	420	70
Southwest winter-wheat area.[5]																		
Clark [6]	3R	Wheat, cattle	1930	13	845	526	28,270	19,132	5,346	[7] 5,413		−67	[7] −1,480					
Do	3R	do	1931	13	1,056	650	[4] 41,128	[4] 22,728	2,910	3,037	−127	−69	−2,183	−1.3	451	−1,732	420	58
Comanche [6]	3R	Cattle, wheat	1930	15	1,292	717	33,500	19,100	7,253	[7] 8,983		−1,630	[7] −3,305					
Do	3R	do	1931	11	1,573	786	[4] 34,380	[4] 22,673	3,059	4,426	−1,367	−1,259	−3,085	−5.2	447	−2,638	420	108

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms: Total	Size of farms: Crops	Capital: Total	Capital: Real estate	Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Perct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Kansas—Continued.																		
Southwest winter-wheat area—Con.																		
Finney [6]	3R	Wheat, corn	1930	11	810	647	16,840	9,745	5,823	[1] 4,797		1,026	[3] 184					
Do	3R	do	1931	13	834	703	[4] 15,723	[4] 10,338	3,105	2,732	373	438	−413	−.3	361	−52	420	65
Ford [6]	3R	Wheat, cattle	1930	15	688	512	21,872	13,782	5,410	[1] 5,353		57	[3] −1,037					
Do	3R	do	1931	11	715	477	[4] 20,020	[4] 14,067	2,276	2,413	−137	−69	−1,138	−2.8	375	−763	420	68
Grant	3R	Wheat	1931	21	1,745	1,355	[4] 24,201	[4] 16,410	5,792	5,089	703	825	−507	1.2	436	−71	420	122
Gray [6]	3R	Wheat, cattle	1930	16	721	572	28,634	21,043	4,823	[1] 4,895		−72	[3] −1,504					
Do	3R	do	1931	19	745	597	[4] 22,109	[4] 16,460	3,690	2,685	1,005	1,063	−100	2.6	356	256	420	58
Meade [6]	3R	do	1930	11	1,005	759	30,472	21,550	6,409	[1] 6,473		−64	[3] −1,588					
Do	3R	do	1931	9	1,127	871	[4] 25,225	[4] 17,083	3,934	4,330	−396	271	−1,657	−3.2	400	−1,257	420	125
Total or average	3R	Winter wheat	1930	81	891	616	26,873	17,567	5,817	[1] 5,911		−94	[3] −1,438		507	−931		
	3R	do	1931	97	1,141	816	[4] 25,696	[4] 16,960	3,753	3,578	175	261	−1,110	−1.0	403	−707	420	86
Louisiana:																		
Acadia, Calcasieu, Jefferson Davis.		Rice	1924	117	488	254	21,683	17,536	8,811	5,761	3,050		1,966					
Acadia, Calcasieu, Jefferson Davis, Vermilion, and border areas of Allen, Evangeline, St. Landry, Cameron.		do	1930	268	349	196	[7] 16,004	[7] 12,058	6,176	5,811	365	513	−435					148
Acadia, Jefferson Davis		do	1929	124	468	229	26,533	22,068	10,676	7,323	3,353	3,701	2,026					348
Ascension, Assumption, Iberia, Iberville, St. Martin, St. Mary, Vermilion.		Sugar cane, cotton, vegetables	1930	129	163	97	9,286	6,955	1,945	1,960	−15	114	−479					129
Bossier, Caddo		Cotton, vegetables, cattle	1924	78	180	63	6,485		1,701	563	1,138		814					
Lafayette		Cotton	1925	80	145	72	16,082		3,456	2,352	1,104	1,254	300	6.1	567	867	123	150
Lincoln		do	1924	74	186	63	4,040	3,427	1,169	471	698		496					
St. Landry		do	1924	139	236	121	15,520	13,265	4,172	1,273	2,899		2,123					
Webster		do	1924	75	208	72	5,884	5,088	1,366	590	776		482					
Minnesota:																		
Beltrami, Carlton, Clearwater, Hubbard, Itasca, Polk, St. Louis, Wadena.	2R	Dairy, potatoes, cattle, poultry.	1931	55	199	97	[5] 10,664	[5] 7,425	1,822	1,486	336	596	−197		253	56	450	260
Dodge	3R	Dairy, hogs, cattle, poultry	1931	17	212	147	[5] 20,935	[5] 13,659	3,922	3,871	51	327	−996		240	−756	500	276

Dodge and Goodhue	3R	do	1928	21	182	126	[5] 23, 721	[5] 17,023	4, 493	2, 501	1, 992	2, 384	806		344	1, 150		392
Do	3R	Dairy, hogs, cattle, small grains, poultry.	1929	44	211	145	[6] 27, 614	[4] 19, 656	5, 578	3, 058	2, 520	2, 898	1, 139		332	1, 471		378
Do	3R	Dairy, hogs, cattle, poultry, small grains.	1930	51	209	144	[5] 25, 706	[5] 18, 233	3, 712	2, 685	1, 027	1, 376	−258		308	50		349
Freeborn	3R	Dairy, hogs, cattle, poultry	1928	20	180	127	[5] 26, 759	[4] 19, 386	5, 158	2, 591	2, 567	2, 844	1, 229		317	1, 548		277
Do	3R	do	1929	23	205	144	[5] 31, 035	[5] 22, 410	6, 550	2, 991	3, 559	3, 881	2, 007		360	2, 373		322
Do	3R	Hogs, dairy, cattle, poultry	1930	29	194	138	[5] 28, 419	[5] 20, 430	4, 579	3, 354	1, 225	1, 698	−196		324	128		473
Do	3R	Dairy, hogs, cattle, poultry	1931	26	204	146	[5] 23, 079	[5] 15, 842	3, 603	3, 145	458	691	−696		255	−441	500	233
Goodhue	3R	do	1931	33	212	141	[5] 22, 744	[5] 16, 226	3, 190	3, 181	9	280	−1, 128		247	−881	500	271
Le Sueur	3R	do	1931	12	189	126	[5] 25, 629	[5] 19, 048	3, 497	3, 385	112	342	−1, 169		253	−916	500	230
Mower	3R	do	1931	8	259	177	[5] 34, 341	[4] 23, 860	6, 379	6, 031	348	896	−1, 360		202	−1, 167	500	548
Nobles and Rock	3R	Cattle, hogs, dairy, corn, flax, poultry.	1929	24	323	241	[5] 47, 490	[5] 35, 804	8, 280	4, 737	3, 543	4, 131	1, 169		432	1, 601		588
Do	3R	Cattle, hogs, corn, dairy, flax, poultry.	1930	22	360	269	[5] 44, 780	[5] 34, 398	6, 846	6, 060	786	1, 218	−1, 453		373	−1, 078		432
Do	3R	Cattle, hogs, dairy, poultry, corn, flax.	1931	24	344	261	[5] 31, 397	[5] 23, 504	5, 328	6, 477	−1, 149	−923	−2, 719		295	−2, 424	500	226
Pine—Askov	3R	Dairy, crops (mostly potatoes and rutabagas) poultry, cattle, hogs.	1925	29	108	53	[5] 13, 764	[5] 10, 564	3, 038	2, 537	501	1, 587	−187		464	277		1, 086
Do	3R	Dairy, crops (mostly potatoes and rutabagas), cattle, hogs, poultry.	1926	25	115	55	[5] 14, 546	[5] 11, 075	2, 994	2, 799	195	1, 364	−532		473	−59		1, 169
Do	3R	Dairy, crops (mostly potatoes and rutabagas), cattle, poultry, hogs.	1927	26	118	59	[5] 14, 133	[5] 10, 905	2, 820	2, 274	555	1, 024	−152		442	290		469
Polk—Crookston	3R	Dairy, wheat, hogs, sugar beets, potatoes, cattle, flax.	1926	18	460	379	[5] 25, 229	[5] 18, 765	4, 932	3, 568	1, 364	1, 781	103		771	874		417
Do	3R	Dairy, hogs, cattle, wheat, flax, potatoes, sugar beets.	1927	18	368	291	[5] 26, 274	[5] 19, 710	4, 251	3, 226	1, 025	1, 419	−289		669	380		394
Do	3R	Potatoes, wheat, dairy, hogs, sugar beets, cattle, flax.	1928	20	361	297	[5] 24, 069	[5] 18, 853	5, 824	4, 832	992	1, 630	−211		731	520		638
Rice	3R	Dairy, hogs, cattle, small grains, poultry.	1928	29	148	99	[5] 22, 315	[5] 15, 935	3, 859	2, 072	1, 787	2, 213	671		302	973		420
Do	3R	Dairy, hogs, cattle, poultry, small grains.	1929	37	139	94	[5] 21, 720	[5] 14, 961	4, 633	2, 236	2, 397	2, 742	1, 311		307	1, 613		345
Do	3R	Dairy, hogs, cattle, poultry	1930	36	150	106	[5] 22, 791	[5] 15, 803	3, 605	2, 459	1, 146	1, 494	6		283	289		348
Do	3R	do	1931	22	156	110	[5] 19, 011	[5] 12, 624	3, 168	2, 781	387	596	−564		226	−338	500	209
Steele	3R	Dairy, hogs, cattle, poultry, small grains.	1928	27	158	108	[6] 22, 694	[5] 15, 851	5, 043	2, 743	2, 300	2, 711	1, 163		275	1, 440		411
Do	3R	do	1929	30	168	116	[5] 25, 819	[5] 17, 776	6, 183	3, 127	3, 056	3, 501	1, 766		309	2, 074		445
Do	3R	Hogs, dairy, cattle, poultry	1930	32	183	128	[5] 27, 755	[5] 19, 277	4, 799	3, 238	1, 561	2, 003	173		311	484		442
Do	3R	Dairy, hogs, cattle, poultry	1931	18	178	126	[5] 23, 206	[5] 14, 727	4, 390	4, 111	279	522	−881		226	−655	500	243
Waseca	3R	Dairy, hogs, cattle, poultry, small grains.	1928	27	158	108	[5] 23, 707	[5] 16, 847	4, 447	2, 247	2, 200	2, 418	1, 018		330	1, 345		218
Do	3R	do	1929	38	163	111	[5] 23, 082	[5] 18, 178	5, 475	2, 618	2, 857	3, 172	1, 703		332	2, 035		315
Do	3R	Hogs, dairy, poultry, cattle	1930	32	170	119	[5] 23, 648	[5] 18, 672	4, 435	3, 205	1, 231	1, 558	49		291	343		327
Do	3R	Dairy, hogs, cattle, poultry	1931	11	211	140	[5] 24, 105	[5] 15, 558	4, 715	3, 654	1, 061	1, 378	−144	2.3	280	136	500	317

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms: Total	Size of farms: Crops	Capital: Total	Capital: Real estate	Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Per ct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Missouri:																		
Atchison—Rockport		Hogs, cattle, corn	1928	13	335	240	48,854	36,701	13,518	8,026	5,492		3,049					
Do.		Hogs, cattle, wheat	1930	78	237		29,079	22,729	4,869	3,806	1,063		−391					
Atchison—Tarkio	3S	Cattle, hogs	1931	140	256		21,275		3,377	4,401	−1,024		−2,088		309			
Bates, Pettis	2S	Hogs, cattle, dairy	1930	47	258	161	[5] 16,769		2,684	3,398	−714		−1,552		[5] 167			
Boone, Knox, Marion, Montgomery, Pike, Ralls, Randolph, part of St. Charles.	2S	Hogs, dairy, cattle	1930	204	224	128	[5] 11,795		2,253	2,254	−1		−591		[5] 187			
Butler, Carter, Madison, Oregon, Reynolds, Washington.	2S	Cattle, hogs, dairy	1930	129	209	83	[5] 7,040		1,189	1,559	−370		−722		[5] 176			
Butler, Dunklin, New Madrid, Pemiscot, part of Scott.	2S	Cotton, other crops, hogs	1930	191	147	123	10,687		2,211	2,048	[5] 163		[5] −371					
Caldwell, Clay, Clinton, Cooper, Holt, Lafayette, Nodaway, Ray, Saline.	2S	Hogs, cattle, crops	1930	251	237	155	[5] 23,398		4,258	3,929	329		−841		[5] 200			
Cape Girardeau, Cole, Jefferson.	2S	Dairy, hogs, crops, cattle	1930	58	173	87	[5] 12,048		1,737	1,634	103		−409		[5] 180			
Cass—Harrisonville		Hogs, cattle, poultry	1927	5	223	120	24,062	18,920	4,749	2,552	2,197		904					
Chariton, Grundy, Howard, Linn, Livingston.	2S	Hogs, cattle, dairy	1930	151	207	120	[5] 13,738		2,457	2,561	−104		−791		[5] 197			
Cole—Jefferson City		Dairy, poultry, hogs	1927	15	177	74	15,658	12,387	2,679	1,672	1,007		224					
Howard—Fayette		Hogs, cattle, dairy	1928	31	186	96	15,080	11,167	3,115	1,821	1,294		540					
Howell, Polk, Wright	2S	Dairy, poultry, hogs	1930	75	193	66	[5] 7,549		1,378	1,430	−52		−429		[5] 162			
Jackson—Lees Summit		Dairy, hogs, poultry	1924	33	153		32,297	28,628	4,858	2,847	2,011		396					
Lawrence—Mt. Vernon.		Dairy, poultry, hogs	1927	6	183	100	19,132	14,675	3,514	1,965	1,549		592					
Linn, Linneus		Wheat, cattle, hogs, sorghum	1924	54	199		19,126	15,836			1,711		755					
Do.	2S	Dairy, hogs, sheep, poultry	1929	98	232	106	14,177	10,604	3,239	2,379	960		251		492			
Nodaway—Linneus		Hogs, cattle, corn	1927		208	141	37,712	30,046	7,016	4,909	2,107		221					
Nodaway—Maryville	2S	Cattle, hogs	1928	66	224	132	28,061	21,342	7,924	5,089	2,835		1,432		551			
Pettis—Sedalia		Hogs, dairy, cattle	1928	11	179	100	18,410	14,524	3,242	2,062	1,180		260					
Ralls—New London		Dairy, hogs, poultry	1926	5	170	96	15,416	11,386	2,531	1,745	786		15					
St. Charles—St. Charles.		do	1924	21	126		24,317	20,939	3,802	1,986	1,816		600					

St. Charles, St. Louis	2S	Crops, dairy, poultry, hogs	1930	39	154	104	[5] 18,969		2,149	1,546	603		−345		[5] 200			
St. Francois—Farmington.		Dairy, poultry, cattle	1929	20	161	69	12,769	9,047	3,742	2,111	1,631		993					
Montana:																		
Fergus, Golden Valley, Musselshell—central Montana.	3R	Cattle, Alfalfa seed	1931	21	7,500	317	35,440	18,685	5,212	6,696	−1,484		−3,256	−4.3			600	
Gallatin	3S	Peas, livestock, dairy, poultry, wheat.	1930	79	459	170	25,722	18,207	4,491	3,688	803	1,003	−483	−1.2			1,124	200
Dryland farming	3S	Wheat, cattle	1930	5	494	176	30,505	25,816	1,806	2,413	−607	−365	−2,132	−5.0			910	242
Ravalli	3S	Large dairy	1925	12	458	134	29,943	23,324				5,139	[2] 3,642					
Do.	3S	Small dairy	1925	33	160	47	11,806	9,992				1,421	[2] 831					
Do.	3S	Diversified	1925	47	148	69	13,745	11,670				2,390	[2] 1,703					
Do.	3S	Cattle and sheep	1925	9	1,093	138	29,960	22,620				2,508	[2] 1,010					
Do.	3S	Poultry	1925	7	51	19	11,988	10,236				1,798	[2] 1,199					
Do.	3S	Crop sales	1925	12	161	78	12,004	10,628				2,542	[2] 1,942					
Do.	3S	Orchard	1925	22	111	40	8,836	7,672				664	[2] 222					
Do.	3S	Strawberries	1925	7	41	20	9,410	6,600				1,126	[2] 655					
Do.	3S	Truck	1925	6	35	26	6,762	6,184				1,442	[2] 1,104					
Montana, North Dakota, South Dakota, Wyoming — northern Great Plains area.	3R	Cattle, wheat, flax	1926	51	[9] 4,864		43,837	22,971	9,976	7,335	2,641	2,889	449	4.0			633	248
Do.		do.	1927	57	[9] 5,773		45,697	24,988	13,562	8,398	5,164	5,423	2,879	9.8			668	259
Do.		do.	1928	55	[9] 5,637		59,194	26,488	16,980	9,046	7,934	8,312	4,974	12.1			745	378
Nebraska:																		
Buffalo	2R	Crops, hogs, cattle	1929	29	227	160	23,667	18,955	[10] 3,968	[10] 2,280	[10] 1,688	[10] 1,725	[10] 949				807	37
Do.	2R	Crops, hogs, dairy	1930	45	282	200	25,354	20,661	2,707	1,317	1,390	1,565	122	2.7			712	175
Do.	2R	Hogs, dairy, poultry	1931	48	266	187	24,009	19,624	1,063	1,146	−83	74	−1,283	−2.8			599	157
Cass	2R	Grain, hogs	1924	15	214	151	43,305	38,820	[10] 3,413	[10] 1,801		[10] 1,612	[2 10] 755					
Do.	2R	Grain, hogs, cattle	1925	23	217	157	44,087	39,529	[10] 4,518	[10] 2,417		[10] 2,101	[2 10] 1,133					
Do.	2R	do.	1926	47	249	184	[5] 45,274	[5] 39,815	[10] 4,171	[10] 2,398		[10] 1,773	[2 10] 713					
Do.	2R	do.	1927	73	232	172	43,970	38,638	[10] 4,260	[10] 2,203		[10] 2,057	[2 10] 912					
Do.	2R	do.	1928	102	232	176	[5] 42,201	[5] 36,408	[10] 5,343	[10] 2,425	[10] 2,918	[10] 3,010	[10] 1,669					92
Do.	2R	do.	1929	109	230	172	[5] 39,593	[5] 32,693	[10] 5,370	[10] 2,625	[10] 2,745	[10] 2,854	[10] 1,578				822	109
Do.	2R	Hogs, cattle	1930	90	225	169	[5] 37,725	[5] 30,930	2,655	1,813	842	1,005	−1,044	.04			704	163
Do.	2R	Hogs, dairy, cattle	1931	69	221	172	[5] 33,503	[5] 28,418	1,188	1,472	−284	−119	−1,959	−2.6			587	165
Cherry	3S	Cattle	1924	[11] 47			69,364	42,883	7,675	5,519	2,156	2,624	−1,312	2.2			634	468
Do.	3S	do.	1925	[11] 47			70,865	42,886	11,358	5,578	5,780	6,257	2,237	7.3			637	477
Do.	3S	do.	1926	[11] 47			71,717	43,345	10,278	5,825	4,453	4,838	867	5.3			624	385
Cheyenne	2R	Grain, hogs	1929	29	766	436	[5] 34,204	[5] 27,296	[10] 6,017	[10] 3,398	[10] 2,619	[10] 2,771	[10] 1,690				811	152
Do.	2R	do.	1930	29	831	447	[5] 30,377	[5] 28,028	5,766	2,908	2,858	3,136	1,039	5.9			714	278
Do.	2R	Hogs, dairy, cattle	1931	34	773	417	[5] 31,707	[5] 25,310	956	1,968	−1,012	−828	−2,597	−5.1			595	184
Custer	2R	Hogs, cattle	1930	30	497	201	[5] 25,202	[5] 19,264	2,352	1,470	882	1,049	−378	.6			720	167
Do.	2R	Hogs, cattle, dairy	1931	26	413	205	[5] 22,000	[5] 16,951	1,208	1,714	−506	−291	−1,606	−5.0			566	215
Douglas	2R	Hogs, grain, dairy, cattle	1924	8	134	104	31,622	27,400	[10] 4,068	[10] 1,670		[10] 2,398	[2 10] 1,475					
Do.	2R	Grain, hogs, dairy	1927	9	149	119	31,867	27,511	[10] 4,152	[10] 1,854		[10] 2,298	[2 10] 1,088					
Do.	2R	do.	1928	11	171	132	[5] 37,778	[5] 32,226	[10] 4,509	[10] 2,135	[10] 2,374	[10] 2,452	[10] 1,262					78
Do.	2R	do.	1929	12	169	132	[5] 35,478	[5] 28,821	[10] 5,613	[10] 2,713	[10] 2,900	[10] 3,000	[10] 1,934				780	100
Do.	2R	Hogs, dairy, cattle	1930	15	172	136	[5] 35,870	[5] 29,012	2,892	2,550	342	518	−1,452	−1.1			720	176
Do.	2R	Dairy, hogs	1931	20	167	132	[5] 32,042	[5] 26,653	1,401	2,061	−660	−498	−2,262	−3.9			595	162

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms: Total	Size of farms: Crops	Capital: Total	Capital: Real estate	Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
				No.	Acres	Acres	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Per ct.	Dolls.	Dolls.	Dolls.	Dolls.
Nebraska—Continued.																		
Fillmore	2R	Grain, hogs, cattle	1929	21	229	178	[5] 31,707	[5] 25,730	[10] 4,353	[10] 2,395	[10] 1,958	[10] 2,085	[10] 1,045				854	127
Do	2R	Hogs, cattle, dairy	1930	27	252	196	[5] 33,349	[5] 26,719	2,517	1,555	962	1,132	−705	.7			720	170
Do	2R	Hogs, grain, cattle	1931	25	244	202	[5] 31,020	[5] 25,378	1,544	1,535	9	184	−1,542	−1.9			597	175
Hall	2R	Hogs, cattle, grain	1930	25	260	200	[5] 28,899	[5] 23,275	2,816	1,505	1,311	1,414	−134	2.0			720	103
Do	2R	Hogs, dairy	1931	33	238	181	[5] 25,947	[5] 21,333	1,426	1,240	186	261	−1,111	−1.6			599	75
Hamilton	2R	Hogs, grain, cattle	1930	36	228	190	[5] 31,337	[5] 25,430	2,987	1,731	1,256	1,648	−311	1.8			705	392
Do	2R	Hogs, dairy, cattle	1931	30	242	203	[5] 30,806	[5] 25,710	1,595	1,878	−283	−9	−1,823	−2.9			596	274
Perkins	2R	Grain, hogs	1929	19	678	488	[5] 39,264	[5] 32,080	[10] 5,851	[10] 3,361	[10] 2,490	[10] 2,559	[10] 1,280				859	69
Do	2R	do	1930	40	728	500	[5] 37,837	[5] 29,752	5,692	2,850	2,842	3,039	950	5.7			704	197
Do	2R	Hogs, grain, dairy	1931	29	745	501	[5] 35,676	[5] 28,452	1,289	2,129	−840	−733	−2,624	−4.0			575	107
Phelps	2R	Livestock, grain	1927	26	328	233	30,127	25,756	[10] 4,451	[1,10] 2,403		[10] 2,048	[2,10] 542					
Do	2R	do	1928	38	333	244	[5] 32,488	[5] 27,105	[10] 3,919	[1,10] 2,509		[10] 1,410	[2,10] −214					
Do	2R	Hogs, grain, cattle	1929	38	360	250	[5] 33,501	[5] 27,221	[10] 4,726	[10] 3,234	[10] 1,492	[10] 1,592	[10] 663				817	100
Do	2R	Hogs, cattle, grain	1930	37	363	255	[5] 33,048	[5] 26,364	3,217	1,806	1,411	1,585	−241	2.1			719	174
Do	2R	Hogs, grain, dairy	1931	34	359	254	[5] 31,311	[5] 25,939	1,506	1,418	88	256	−1,478	−1.6			600	168
Saunders	2R	Grain, hogs, cattle	1929	29	183	150	38,816	32,850	4,797	2,361	2,436	2,562	1,265	4.3			776	126
Do	2R	Hogs, dairy, poultry	1930	30	196	160	41,380	34,686	2,628	1,674	954	1,143	−1,115	.6			720	189
Do	2R	do	1931	26	201	168	36,890	31,622	1,193	1,404	−211	−102	−2,056	−2.2			600	109
Webster	2R	Hogs, cattle	1930	24	296	182	23,078	17,212	3,125	1,977	1,148	1,269	−6	2.0			688	121
Do	2R	Hogs, poultry, cattle	1931	40	273	176	20,061	15,734	1,549	1,857	−308	−170	−1,311	−4.4			578	138
Nevada:																		
Churchill, Lyon—Newlands project.		Dairy, turkeys, cattle, poultry.	1926	19	94	59	16,940	11,217	4,004	2,371	1,633	2,096	786		[11] 431	1,217		463
Do		Dairy, cattle, turkeys, poultry.	1927	17	86	49	15,896	10,094	4,233	2,353	1,880	2,154	1,085		[11] 390	1,475		274
Do		Dairy, cattle, turkeys, poultry, hay.	1928	19	96	54	16,444	11,110	4,787	2,557	2,230	2,499	1,408		[11] 355	1,763		269
Do		Dairy, cattle, turkeys, grain, poultry.	1929	3	116	72	25,905	14,394	5,436	3,749	1,687	1,735	392		[11] 490	882		48
Do		Cattle, dairy, turkeys	1930	4	134	85	24,754	16,377	4,393	[1] 3,838		555	[2] −683		[12] 423	−260		
Do		Dairy, turkeys, poultry, hay, cattle.	1931	17	94	57	14,149	9,988	2,368	[1] 1,519		849	[2] 142		[12] 263	405		
Douglas—Carson Valley.		Cattle, dairy, hogs	1928	7	322	127	60,737	43,080	10,664	4,950	5,714	6,409	2,677		[11] 905	3,582		695
Do		do	1929	7	444	134	71,255	50,688	11,766	6,494	5,272	6,050	1,709		[12] 957	2,666		778
Do		do	1930	7	448	138	70,467	50,613	7,953	6,334	1,619	2,126	−1,904		[12] 988	−916		507
Do		Cattle, dairy, hogs, poultry	1931	15	415	120	49,937	37,723	3,982	[1] 3,764		218	[2] −2,279		[12] 736	−1,543		
Elko		Cattle	1928 1930	11	5,044	837	123,044	61,188	19,197	11,046	8,151	9,001	1,999					850

Lyon—Mason and Smith Valleys.	......	Sheep, dairy, hogs	1930	5	497	200	62,313	41,300	9,634	8,444	1,190	2,023	−1,926	......	[11] 792	−1,134	......	833
Do	......	Dairy, cattle, hogs, hay	1931	5	408	139	43,520	29,909	4,052	[1] 3,792	......	260	[2] −1,916	......	[11] 380	−1,536	......	......
Lyon—Smith Valley	......	Sheep, dairy, cattle, hay, potatoes.	1929	5	270	129	36,311	27,442	6,082	3,650	2,432	3,065	616	......	[11] 675	1,291	......	633
Washoe—Truckee meadows.	......	Dairy, poultry, potaotes, cattle, work.	1926	7	81	47	26,664	20,307	4,753	3,363	1,390	2,167	57	......	[11] 781	838	......	777
Do	......	Dairy, cattle, poultry, hay, work.	1927	5	89	49	28,868	22,202	4,812	2,768	2,044	2,617	601	......	[11] 822	1,423	......	573
Do	......	Dairy, hay, poultry, onions, cattle.	1928	4	96	56	30,300	23,678	5,416	2,791	2,625	3,204	1,110	......	[11] 759	1,869	......	579
Do	......	Dairy, poultry, cattle	1931	6	168	69	21,729	16,964	2,757	[1] 2,163	......	594	[2] − 492	......	[11] 498	6	......	......
New Mexico:																		
Bernalillo, Sandoval, Socorro, Valencia—middle *Rio Grande* conservancy district—																		
Dairy farms	2	Dairy	1929	20	55	25	21,543	......	12,257	9,278	2,979	3,149	1,902	10.4	[5] 248	2,150	729	170
Do	2	do	1930	20	56	24	22,229	......	11,936	9,357	2,579	2,784	1,468	8.3	[5] 248	1,716	729	205
Fruit farms	2	Fruit	1929	12	48	23	22,143	......	3,787	2,489	1,298	1,395	191	4.1	[5] 160	351	390	97
Do	2	do	1930	12	50	24	19,114	......	1,968	1,693	275	300	−681	−.4	[5] 160	−521	360	25
General farms	2	Crops (mostly corn, wheat, alfalfa, fruit, vegetables), livestock (mostly cattle, sheep, dairy, poultry).	1929	54	118	35	8,014	......	1,496	932	564	639	163	2.5	[5] 212	375	367	275
Do	2	do	1930	54	113	30	7,943	......	915	1,014	−99	124	−496	−5.6	[5] 212	−284	337	223
Poultry farms	2	Poultry	1929	8	9	3	6,214	......	3,770	2,769	1,001	1,031	690	8.5	[5] 101	791	474	30
Do	2	do	1930	8	9	2	6,186	......	3,286	2,831	455	474	146	.2	[5] 101	247	442	19
Vegetable farms	2	Celery, cantaloupes, onions, fruit, cabbage, tomatoes, chili, spinach, other crops.	1929	9	35	19	10,514	......	4,115	3,199	916	1,295	390	3.0	[5] 247	637	600	379
Do	2	do	1930	9	41	20	11,357	......	5,243	3,772	1,471	2,176	903	8.1	[5] 247	1,150	546	705
Catron, Grant, McKinley, Sierra, Socorro, Valencia.	38	Cattle	1925	28	10,492	11	72,376	33,927	19,218	11,787	7,431	7,540	3,812	9.7	......	......	430	109
Chaves, Dona Ana, Eddy, Grant, Hidalgo, others.	38	do	1925	45	6,028	52	104,851	47,937	29,313	15,375	13,938	14,124	8,696	12.8	......	......	473	186
Colfax, Curry, De Baca, Guadalupe, Harding, others.	38	do	1925	54	9,423	184	92,078	54,979	25,272	13,633	11,639	11,746	7,035	12.0	......	......	561	109
Curry	38	Grain sorghum, wheat, dairy, work, poultry, cattle, hogs, corn, broomcorn.	1924	99	503	233	15,481	12,869	3,302	1,337	1,965	2,120	1,191	8.3	448	1,639	675	156
Do	38	Grain sorghum, wheat, dairy, cattle, poultry, corn, hogs.	1924	65	470	233	13,393	10,844	3,638	1,635	2,003	2,135	1,333	9.7	470	1,803	710	132
Do	38	Grain sorghum, dairy, cattle, poultry, hogs.	1925	65	468	235	13,451	10,969	1,678	1,546	132	235	−541	−3.2	504	−37	559	103
Do	38	Wheat, grain sorghum, dairy, cattle, poultry.	1926	65	471	244	13,590	11,069	4,225	2,026	2,199	2,300	1,519	12.0	495	2,014	564	101

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms		Capital		Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
					Total	Crops	Total	Real estate										
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Per ct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
New Mexico—Continued.																		
Curry	3S	Dairy, cattle, poultry, grain sorghum.	1927	65	486	265	13,621	11,005	2,044	1,572	472	593	−209	−.5	481	272	545	121
Do	3S	Wheat, grain sorghum, dairy, poultry, cattle.	1928	65	469	315	13,529	10,871	3,208	1,904	1,304	1,424	628	6.2	464	1,092	470	120
Roosevelt	3S	Dairy, cattle, cotton, poultry, broomcorn, grain sorghum, rent, hogs, corn, wheat, work.	1924	97	694	144	13,247	10,616	2,356	829	1,527	1,663	865	6.8	472	1,337	625	136
Do	3S	Dairy cattle, grain sorghum, broomcorn, cotton, poultry, hogs, corn.	1924	60	707	145	11,633	8,787	2,623	1,010	1,613	1,755	1,031	8.3	492	1,523	648	142
Do	3S	Cattle, dairy, poultry, broomcorn, grain sorghum.	1925	60	760	139	11,598	8,835	1,710	1,435	275	434	−305	−2.5	472	167	562	159
Do	3S	Cattle, dairy, broomcorn, grain sorghum, poultry, cotton.	1926	60	769	160	11,617	8,769	2,499	1,380	1,119	1,322	538	5.1	492	1,030	528	203
Do	3S	Cattle, dairy, broomcorn, poultry, grain sorghum.	1927	60	776	151	11,829	8,808	2,421	1,420	1,001	1,219	410	4.1	446	856	514	218
Do	3S	Cattle, dairy, broomcorn, grain sorghum, poultry.	1928	60	793	175	12,012	8,891	2,838	1,548	1,290	1,499	689	6.7	443	1,132	490	209
North Dakota:																		
Barnes, Grand Forks, Nelson, Steele.	3R	Grain, dairy, cattle, hogs	1930	35	544	439	[5] 29,717	[5] 16,128	2,818	2,953	−135	94	−1,621		[5] 283	−1,338		229
Do	3R	do	1931	37	544	435	[5] 26,991	[5] 20,318	2,036	2,640	−604	−328	−1,954		[5] 268	−1,686		276
Several counties	3R	do	1931	17	937		[5] 30,280	[5] 22,388	1,685	2,571	−886	−786	−2,400		[5] 276	−2,124		100
Oklahoma:																		
Alfalfa, Garfield, others	2R	Wheat, hogs, dairy, cattle, poultry.	1927	37	279		17,713	12,270	3,592	[1] 1,558		2,034	[2] 1,148					
Do		Wheat, cattle, poultry, dairy	1928	40	293		18,140		4,953	[1] 2,032		2,921	[2] 2,014					
Blaine	3S	Wheat	1928	110	221	167	18,930	15,609	3,305	1,767	1,538		592					
Craig, Mayes	2R	Dairy, poultry, cattle, hogs	1931	50	262	134	10,616	7,566	1,646	1,533	113	193	−418	−1.9				80
Garfield	3S	Wheat	1928	107	239	167	24,300		4,410	2,392	2,018		803					
Do	2R	Wheat, dairy, poultry, cattle	1930	18	311	223	32,513	26,412	4,109	3,481	628		−998	−1.2				
Do	2R	do	1931	57	351	224	26,841	22,955	2,704	2,314	390		−952	−1.4				
Mayes, others		Poultry, crops, cattle, dairy	1928	17	161		8,120		2,321	[1] 945		1,376	[2] 970					
Tillman		Cotton	1929	108	218	197	34,835	31,463	7,644	4,647	2,997		1,255	6.9				
Washita, others		Cotton, wheat, cattle, poultry.	1928	19	183		13,360		3,937	[1] 1,580		2,357	[2] 1,689					

Several counties		Wheat, cotton, cattle, poultry, dairy.	1928	119	215		12, 060		3, 643	[1] 1, 461		2, 182	[2] 1, 579					
Northeastern Oklahoma.	2R	Crops (mostly wheat), poultry, hogs, dairy.	1929	14	176		9, 939				1, 055		558	5. 0				
Do	2R	Crops (mostly wheat), poultry, dairy, hogs.	1930	22	300		13, 179				532		−127	−. 6				
Do	2R	Crops (mostly wheat), dairy, cattle, poultry.	1931	70	250		10, 385	7, 844	1, 504	1, 211	293	455	−226	−3. 0			600	162
Northwestern Oklahoma.	2R	Crops (mostly wheat), hogs, cattle, dairy.	1929	45	330		28, 274				2, 294		880	6. 0				
Do	2R	Crops (mostly wheat), cattle, hogs, dairy.	1930	58	320		25, 319				389		−877	−. 9				
Do	2R	Crops (mostly wheat), cattle, dairy, hogs.	1931	101	366		25, 519	21, 183	2, 821	2, 320	501	633	−775	−. 4			600	132
Oregon:																		
Crook, Deschutes—Irrigated.		Dairy, potatoes, hay, other crops.	1925	49	86	53	14, 883	11, 352	4, 126	1, 774	2, 352	2, 466	1, 608	10. 1			854	114
Jackson, Josephine		Pears, apples	1924, 1926–1927	162	107	78	55, 188	52, 704	11, 080	7, 573	3, 507	3, 507	748	4. 8			847	
Lane		Crops, dairy, poultry, sheep (diversified).	1928	31	235	97	22, 661	18, 371	4, 758	2, 579	2, 179	2, 367	1, 046	6. 6			679	188
Do		Fruit (prunes, cherries, nuts, apples, pears).	1928	26	63	41	19, 953	18, 381	4, 117	2, 731	1, 386	1, 657	368	4. 3			529	271
Lane—Willamette Valley.		Dairy	1928	16	123	68	20, 725	16, 322	4, 048	3, 023	1, 025	1, 292	−11	1. 5			715	207
Lane—Coast section		do	1928	15	225	27	18, 959	15, 139	3, 349	2, 011	1, 338	1, 470	390	3. 4			694	138
Do		Poultry	1928	14	52	37	13, 796	11, 293	3, 408	2, 635	773	959	83	0			770	186
Do		Vegetables	1928	13	46	33	15, 352	13, 785	4, 401	2, 829	1, 572	1, 946	804	4. 1			943	374
Do		Cattle, sheep, goats	1928	11	2, 546	108	36, 805	25, 022	6, 969	3, 490	3, 479	3, 636	1, 639	7. 6			669	157
State—18 counties, commercial egg farms.		Poultry, dairy	1926–1928	441	57	24	11, 291	8, 800	3, 868	3, 045	823	1, 099	258	−. 3			659	276
State—22 counties, dairy farms.		Dairy	1929	537	163	69	18, 308	14, 272	3, 935	2, 337	1, 598	1, 866	683	3. 2			1, 020	268
Umatilla—Irrigated		Alfalfa hay, dairy, miscellaneous crops.	1925	14	90	60	9, 812	8, 054	2, 105	1, 046	1, 059	1, 707	568	2. 5			814	648
Willamette and Umpqua Valleys.		Prunes, miscellaneous fruits, and crops.	1923–1926	375	159	61	27, 482	25, 451	3, 885	2, 894	991	1, 119	−383	1. 0			716	128
South Dakota:																		
Brown	3R	Spring wheat	1925	10	377		32, 217		6, 323	3, 894	2, 429	2, 777	818		[13] 262			348
Clay, Lincoln, Union—Beresford.	3R	Cattle, hogs	1928	16	260	200	51, 310		14, 585	10, 316	4, 269	5, 040	1, 703	6. 4	376	2, 079	1, 000	771
Kingsbury	3R	Hogs, dairy, cattle	1922	20	287		43, 611	32, 772	3, 866	2, 419	1, 447	1, 949	−734		[12] 256			502
Do	3R	Hogs, cattle, dairy	1923	20	298		44, 419	33, 185	4, 130	2, 732	1, 398	1, 879	−823		[13] 270			481
Do	3R	do	1924	20	290		43, 746	32, 184	4, 712	2, 113	2, 599	3, 000	412		[14] 288			401
Potter	2R	Hogs, cattle, wheat, dairy	1930	48	652	464	31, 765	22, 619	4, 395	3, 960	435	682	−1, 153	−. 2	534	−619	500	247
Texas:																		
Brewster, Culberson, Hudspeth, Jeff Davis, others.	3S	Cattle, sheep	1925	33	46, 586	26	313, 214	227, 685	41, 053	10, 733	30, 320	30, 627	14, 659	9. 5			667	307

See footnotes at end of table.

TABLE 462.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms: Total	Size of farms: Crops	Capital: Total	Capital: Real estate	Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
				No.	*Acres*	*Acres*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Per ct.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Texas—Continued.																		
Collin, Rockwell		Cotton	1925–1927	11	133	119	[5] 25,226	[5] 22,886	4,208	2,816	1,392	1,562	131	4.3	644	775	305	170
Dawson, Hockley, Lamb, Lubbock, Lynn.	3R	Cotton, dairy, poultry	1931	141	290	237	[5] 10,585	[6] 8,410	2,172	1,583	589	700	60	3.3	267	327	238	111
Gregg, Harrison, Smith.		Tomatoes, sweetpotatoes, vegetables, dairy, poultry.	1928–1929	9	184	86	[6] 9,798	[5] 7,429	2,389	1,656	733	938	243	4.1	352	595	331	205
Lubbock	3S	Cotton, dairy	1924	139	232		22,444	19,582	4,535	1,888	2,647	2,862	1,525	8.7	708	2,233	687	215
Sutton, others	3S	Cattle, sheep, goats, wool, mohair.	1925–1928	[14] 106	7,680		[5] 135,672	[6] 98,352	21,000	8,292	12,708	12,708	5,924	8.8			720	
Wilbarger		Cotton, wheat, cattle, poultry	1922	69	222		18,307	15,551	2,717	1,605	1,112	1,219	197					107
Utah:																		
Beaver and others—																		
Cattle ranches	3S	Cattle	1925	55	1,974		35,733	22,519	7,102	5,416	1,686		−101	2.4	555	454	841	
Sheep ranches	3S	Sheep	1925	54	4,626		70,976	34,644	22,970	12,139	10,831		7,282	13.9	349	7,631	979	
Cattle and sheep ranches.	3S	Cattle, sheep	1925	15	7,322		111,937	54,247	31,228	20,532	10,606		5,099	8.4	549	5,648	1,259	
Box Elder, Cache, Davis, Juab, Salt Lake, Utah, Weber.	3S	Apples, poultry, peaches, dairy, pears, work.	*1926*	*126*			*16,014*	*14,665*	*3,128*	*1,795*	*1,333*		532	3.1			833	
Box Elder, Cache, Davis, Morgan, Salt Lake, Sevier, Tooele, Utah, Weber, others.	2R	General farming, livestock	1931	127	142	74	14,289	10,714	1,985	1,124	861	1,158	147	.7	465	612	758	297
Box Elder, Cache, Salt Lake, Utah, others.	3S	Poultry, dairy	1929	119	56	32	13,468	10,151	5,472	3,241	2,231	2,508	1,558		507	2,065		277
Do	3S	Poultry	1930	100	36	22	11,116	8,322	5,639	3,717	1,922	2,166	1,366	4.6	413	1,779	865	244
Do	3S	do	1931	100	52	21	10,405	8,024	3,736	3,074	662	834	142		359	501		172
Millard	2S	Dairy, sheep, alfalfa seed	1930	92	101	70	7,135	5,071	1,401	1,633	−232	2	−589	−5.0	356	−233	778	234
Do	2S	do	1931	111	96	67	6,973	5,292	1,421	1,246	175	378	−174	−3.8	297	123	443	203
Summit	2S	Dairy, cattle, poultry, sheep	1930	61	325	73	14,080	10,121	2,620	1,749	871	1,196	167	1.2	386	553	700	325
Washington—Dixie section.	2S	Work, dairy, cattle, fruit, vegetables, poultry.	*1928*	*69*	*60*	22	*7,660*	*6,662*	*1,554*	740	814	975	431					161
Washington:																		
Chelan—central Washington.	2S	Apples	1926	16		83	[1] 78,240	[1] 72,537	27,204	31,630	−4,426	−4,426	−8,338					
Do	2S	do	1927	17		99	[1] 83,721	[1] 75,298	*46,391*	*39,550*	*6,841*	6,841	2,655					
Do	2S	do	1928	15		83	[1] 78,489	[1] 71,792	39,650	42,742	−3,092	−3,092	−7,016					
Chelan—Wenatchee	2S	do	1926	77	28	17	[1] 28,583	[1] 26,310	7,587	7,476	111	180	1,318	−3.1	[1] 373	−945	986	69
Do	2S	do	1927	81	26	17	[1] 28,295	[1] 26,139	11,510	6,983	4,627	4,655	3,212	12.9	[1] 354	3,566	972	58

Do.	2S	do.	1928	81	25	18	1 27,860	1 25,776	10,585	8,333	2,252	2,296	859	4.7	1 309	1,168	945	44
King, Pierce	2S	Berries, potatoes, miscellaneous fruits, vegetables, general crops, dairy, poultry, wood, work.	1921	47	35	14	1 11,558	1 10,119	1,848	1,558	290	488	−288	−2.7	1 341	53	607	198
Do.	2S	Berries	1923–24	124	16	13	1 15,535	1 14,846	3,034	3,035	899	1,073	122	−.2	1 211	333	936	174
Do.	2S	Berries, dairy	1923–24	32	43	31	1 26,723	1 24,782	6,286	5,627	639	813	−697	−2.4	1 245	−452	1,277	174
Do.	2S	Berries, poultry	1923–24	57	11	7	1 13,769	1 12,504	4,202	2,936	1,266	1,430	578	2.0	1 254	832	988	164
King, Pierce, Whatcom	2S	Poultry	1924	53	17	9	1 7,832	1 5,937	3,857	2,742	1,115	1,115	723	4.0	1 146	869	798	-----
Do.	2S	do.	1925	60	21	10	1 8,665	1 6,384	4,556	3,240	1,316	1,316	883	4.8	1 315	1,198	901	-----
Kittitas	3R	Livestock, dairy, potatoes, hay, grain.	1928	47	111	92	1 26,373	-----	6,057	3,654	3,103	-----	1,784	7.2	-----	-----	1,200	-----
San Juan	3R	Dairy, poultry, miscellaneous crops.	1927	21	-----	68	1 17,648	-----	3,435	1,625	1,810	-----	928	-----	-----	-----	-----	-----
Do.	3R	do.	1928	22	-----	59	1 16,851	-----	3,953	1,774	2,179	-----	1,336	-----	-----	-----	-----	-----
Skagit	3R	do.	1927	21	-----	65	1 13,598	-----	5,225	2,969	2,256	-----	1,576	-----	-----	-----	-----	-----
Do.	3R	do.	1928	26	-----	56	1 12,553	-----	4,986	2,940	2,046	-----	1,418	-----	-----	-----	-----	-----
Do.	3R	do.	1929	23	-----	51	1 12,792	-----	4,954	2,900	2,054	-----	1,414	-----	-----	-----	-----	-----
Do.	3R	Dairy, crops, poultry	1930	20	-----	47	1 14,295	-----	3,858	2,954	904	-----	189	-----	-----	-----	-----	-----
Spokane	2S	Orchard	1925	12	14	12	1 11,010	1 10,475	1,121	1,632	−511	−496	−1,062	−9.6	1 403	−659	543	15
Do.	2S	Truck	1925	12	12	11	1 6,507	1 5,996	1,819	1,348	471	637	146	−7.4	1 380	526	952	166
Do.	2S	Truck, orchard	1925	44	14	13	1 9,997	1 9,545	1,911	1,690	221	346	−279	−3.8	1 432	153	596	125
Do.	2S	Truck, poultry	1925	7	15	12	1 9,760	1 8,643	3,324	2,439	885	1,042	397	1.5	1 486	883	736	157
Do.	2S	Truck, poultry, orchard	1925	17	11	10	1 10,647	1 9,606	2,581	2,446	135	268	−397	−6.4	1 443	46	815	133
Spokane—all farms	2S	do.	1925	113	15	14	1 9,733	1 9,070	2,008	1,775	233	359	−254	−4.8	1 431	177	702	126
Do.	3R	Dairy, poultry, grain, hay, miscellaneous crops.	1928	19	-----	101	1 12,560	-----	2,995	1,719	1,276	-----	648	-----	-----	-----	-----	-----
Do.	3R	do.	1929	20	-----	80	1 15,009	-----	3,616	2,053	1,563	-----	813	-----	-----	-----	-----	-----
Do.	3R	do.	1930	15	-----	75	1 17,215	-----	3,377	2,162	1,215	-----	354	-----	-----	-----	-----	-----
Thurston	3R	Poultry, dairy, miscellaneous crops.	1926	17	30	14	1 6,292	-----	4,053	2,345	1,708	-----	1,393	-----	-----	-----	-----	-----
Do.	3R	Dairy, livestock, miscellaneous crops.	1927	13	-----	41	1 15,344	-----	7,659	4,526	3,133	-----	2,366	-----	-----	-----	-----	-----
Do.	3R	Poultry, dairy, miscellaneous crops.	1928	16	-----	16	1 7,584	-----	5,065	3,197	1,868	-----	1,489	-----	-----	-----	-----	-----
Do.	3R	Dairy livestock, miscellaneous crops.	1929	13	-----	43	1 12,736	-----	6,436	4,117	2,319	-----	1,682	-----	-----	-----	-----	-----
Whatcom	3R	Poultry, dairy, livestock, hay, oats.	1929	22	-----	34	1 14,732	-----	5,507	3,299	2,208	-----	1,471	-----	-----	-----	-----	-----
Do.	3R	do.	1929	22	-----	37	1 14,994	-----	5,160	3,181	1,979	-----	1,229	-----	-----	-----	-----	-----
Do.	3R	do.	1930	21	-----	33	1 16,420	-----	4,792	3,659	1,133	-----	312	-----	-----	-----	-----	-----
Do.	3R	do.	1931	21	-----	34	1 11,347	-----	3,172	2,324	848	-----	281	1.5	-----	-----	678	-----
Yakima	3R	Dairy, potatoes, hay, fruit	1927	30	-----	57	1 23,617	-----	5,604	3,967	1,637	-----	456	-----	-----	-----	-----	-----
Do.	3R	do.	1928	30	-----	57	1 23,617	-----	6,470	4,478	1,992	-----	811	-----	-----	-----	-----	-----
Do.	2S	Apples	1926	91	27	22	1 25,938	1 24,429	7,806	6,845	961	1,056	−336	.1	1 359	23	939	95
Do.	2S	do.	1927	90	29	24	1 28,215	1 26,656	9,868	6,082	3,586	3,660	2,175	9.4	1 351	2,526	938	74
Do.	2S	do.	1928	89	26	22	1 25,800	1 24,194	8,492	6,751	1,741	1,809	451	3.7	1 356	809	914	68
Wyoming:																		
Big Horn	2S	Beans	1929	184	200	62	8,252	5,630	3,218	2,147	1,071	1,359	658	5.7	-----	-----	600	288
Big Horn Basin	2S	Sheep	1927	30	4,759	-----	123,096	50,572	43,227	26,417	16,810	16,810	10,655	-----	-----	-----	-----	-----

See footnotes at end of table.

TABLE 402.—*Farm business studies: Summaries of 21,033 farm records from 190 localities in 21 States, 1924–1931*—Continued

State, county, locality	Key	Principal sources of receipts	Year covered by study	Farms included	Size of farms		Capital		Receipts	Expenses	Farm income	Family income	Labor income	Return to capital	Family living from the farm	Operator's earnings	Farmer's labor	Other unpaid family labor
					Total	Crops	Total	Real estate										
				No.	Acres	Acres	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Dolls.	Per ct.	Dolls.	Dolls.	Dolls.	Dolls.
Wyoming—Continued.																		
Campbell, Crook	38	Cattle	1924	60	7,115		53,777	32,469	8,217	4,607	3,610	3,870	921	5.6			600	260
Carbon	38	do	1929	18	3,360	736	88,190	46,510	18,691	12,675	6,016	6,494	1,606	5.6			1,047	478
Do	38	do	1930	18	4,032	792	100,973	48,634	12,052	11,047	1,005	1,223	−4,044	0			985	218
Do	38	do	1931	18	3,946	807	88,651	49,181	7,230	8,589	−1,359	−1,214	−5,792	−2.3			689	145
Do	28	Dairy, hay	1930	19	608	188	23,296	15,377	3,810	2,123	1,687	1,687	522					
Central area	28	Sheep	1926	35	3,051	87	97,864	26,260	39,110	22,065	17,045	17,045	12,152	14.8			25,573	
Goshen	28	Sugar beets	1928	98	212		12,332	7,873	6,754	5,502	1,252	1,763	635	2.9			900	511
Mountain Valley	28	Cattle	1926	47	2,576	871	91,643	53,644	13,141	8,625	4,516	5,016	−66	3.2			1,538	500
Southwestern	38	Sheep	1925	65	14,694	515	131,726	49,002	45,647	25,684	19,963	19,963	13,377	13.3			2,507	

[1] Does not include other unpaid family labor.
[2] Family labor income.
[3] Prior to 1930, total capital and real estate do not include value of dwelling, except on rented farms. Receipts include value of family living from the farm (food and fuel) and livestock sales (not livestock net increase). Expenses do not include unpaid family labor but do include interest on indebtedness and livestock purchases. Family income includes family living from the farm, but interest paid on indebtedness has been deducted. The figure carried in this column for labor income is not comparable with those in other States and may more properly be called "management returns" which is obtained by deducting from family income pay for operator and family labor at hired man's wages and interest on investment. Interest on real estate is calculated at 3.5 per cent on rented farms and on the farmer's equity on owner farms and at 7 per cent on working capital. State figures for 1928 to 1931 include all region and county figures.
[4] Does not include value of rented land and value of dwelling.
[5] Does not include value of farmer's dwelling, or house rent.
[6] In these counties in 1930 all figures except acreages are for the operator only. For all the counties about 20 per cent of the farms were straight owner farms, about 20 per cent straight tenant farms, and about 60 per cent were farms whose operators owned part of the land and rented part. A share of the crops was given for the use of the rented land. The average owned acreages per farm for the several counties were Clark 438, Comanche 472, Finney 277, Ford 288, Gay 454, Meade 465, all counties 402.
[7] Does not include value of rented land.
[8] Includes family living from the farm except house rent.
[9] In 1928, acres include 2,197 acres owned and 2,667 acres leased; in 1929 includes 2,433 acres owned and 3,340 acres leased; and in 1930 includes 2,615 acres owned and 3,022 acres leased.
[10] Operator's share only.
[11] These 47 farms are included in the 71 farms for Cherry County published in Table 652, Yearbook 1925.
[12] Does not include fruits and vegetables.
[13] Food only.
[14] Consists of 21 ranches for 4 years, 4 ranches for 3 years, 4 ranches for 2 years, 2 ranches for 1 year.

TABLE 463.—*Index numbers of prices paid by farmers, 1910–1932*

[Base 1910–1914 = 100]

Year	Commodities used in production: Feed	Commodities used in production: Machinery	Commodities used in production: Fertilizer	Commodities used in production: Building materials for other than house	Commodities used in production: Equipment and supplies	Commodities used in production: Seed [1]	Commodities used in production: All commodities bought for use in production	Wage rates paid to hired labor	Commodities bought for use in production plus wages paid to hired labor	Commodities bought for family maintenance [2]	All commodities bought for use in production and family maintenance
	Index No.	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1910	92	101	97	100	101	-----	98	97	98	98	98
1911	108	103	97	102	100	-----	103	97	102	100	101
1912	90	100	102	103	100	105	98	101	99	101	100
1913	108	98	104	101	100	94	102	104	102	90	100
1914	103	98	101	93	99	101	99	101	100	102	101
1915	98	101	113	102	106	117	103	102	103	107	106
1916	129	111	122	118	129	112	121	112	119	125	123
1917	186	132	139	137	156	141	152	140	149	148	150
1918	196	160	173	161	180	188	176	176	176	180	178
1919	208	178	185	189	179	264	192	206	196	214	205
1920	133	188	189	205	188	149	175	239	189	227	206
1921	91	175	159	156	151	125	142	150	144	165	156
1922	118	156	131	159	139	133	140	146	142	160	152
1923	128	151	128	160	138	142	142	166	147	161	153
1924	135	155	122	159	131	148	143	166	148	162	154
1925	145	158	131	163	130	170	149	168	154	165	159
1926	120	156	129	163	142	190	144	171	150	164	156
1927	124	157	123	164	134	192	144	170	150	161	154
1928	133	158	133	161	131	179	146	169	151	162	156
1929	131	162	132	162	129	190	146	170	152	160	155
1930	119	159	128	158	124	169	140	152	142	151	146
1931	84	154	117	141	111	154	122	116	121	129	126
1932	61	149	101	129	102	104	108	86	103	110	109

Bureau of Agricultural Economics. Compiled from prices reported to the Department of Agriculture by retail dealers throughout the United States. The index numbers include only commodities bought by farmers; the commodities being weighted according to purchases reported by actual farmers in farm management and rural-life studies from 1920 to 1925.

[1] 1912–1914 = 100.

[2] Includes food, clothing, household operating expenses, furniture and furnishing, and building material for house.

TABLE 464.—*Index numbers of farm prices, by groups 1910–1932*

[August, 1909–July, 1914 = 100]

Year	Calendar year: Grains	Calendar year: Fruits and vegetables	Calendar year: Meat animals	Calendar year: Dairy products	Calendar year: Poultry products	Calendar year: Cotton and cotton seed	Calendar year: All groups	Year beginning July 1 of year shown: Grains	Year beginning July 1: Fruits and vegetables	Year beginning July 1: Meat animals	Year beginning July 1: Dairy products	Year beginning July 1: Poultry products	Year beginning July 1: Cotton and cotton seed	Year beginning July 1: All groups
	Index No.	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1910	104	91	103	100	104	113	103	95	96	94	98	95	114	98
1911	96	106	87	97	91	101	95	107	120	88	101	98	84	97
1912	106	110	95	103	101	87	99	93	87	104	101	97	93	97
1913	92	92	108	100	101	97	100	98	105	111	101	106	99	103
1914	103	100	112	100	105	85	102	120	85	108	99	104	69	101
1915	120	83	104	98	103	78	100	109	98	110	98	104	94	104
1916	128	123	120	102	116	119	117	172	186	143	112	138	148	146
1917	217	202	173	125	157	187	176	229	162	192	139	169	229	192
1918	226	162	202	152	185	245	200	226	170	210	162	194	234	203
1919	231	189	206	173	206	247	209	246	252	190	185	217	286	220
1920	231	249	173	188	222	248	205	164	163	140	170	191	140	152
1921	112	148	108	148	161	101	116	102	175	107	137	150	129	119
1922	105	152	113	134	139	166	123	111	129	110	141	142	194	130
1923	114	136	106	148	145	216	134	112	131	104	144	141	224	132
1924	129	124	109	134	147	211	134	155	134	125	131	158	188	142
1925	156	160	139	137	161	177	147	140	200	144	139	157	151	143
1926	129	189	146	136	156	122	136	124	153	142	137	148	106	129
1927	128	155	139	138	141	128	131	136	160	141	138	146	154	138
1928	130	146	150	140	150	152	139	119	119	158	141	154	150	137
1929	121	136	156	140	159	145	138	117	169	150	133	162	130	133
1930	100	158	134	123	126	102	117	82	125	112	109	105	79	97
1931	63	98	93	94	96	63	80	51	79	73	83	85	48	65
1932	44	71	63	70	80	46	57	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. See footnotes, Table 3.

TABLE 465.—*Index numbers of farm prices, United States, 1923–1932*

[August, 1909–July, 1924=100]

Group and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
GRAINS	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1923	113	114	117	121	123	119	112	109	111	113	110	108
1924	110	113	114	113	114	116	130	141	140	150	147	155
1925	172	178	172	152	159	164	152	157	148	135	138	140
1926 [1]	143	140	133	131	131	130	125	128	121	123	121	120
1927 [1]	120	122	121	119	127	140	139	138	134	128	120	123
1928 [1]	125	128	136	144	160	152	142	120	117	116	110	112
1929 [1]	115	123	124	120	113	111	122	129	131	128	118	119
1930 [1]	118	115	107	110	105	106	92	101	100	92	80	80
1931 [1]	77	75	74	74	74	67	57	54	50	46	57	52
1932	52	51	51	50	49	44	42	43	41	36	34	33
FRUITS AND VEGETABLES												
1923	117	122	130	146	157	161	165	151	131	123	114	114
1924	118	123	123	128	132	146	142	138	113	109	108	110
1925	122	131	138	146	162	184	178	178	142	152	194	194
1926 [2]	214	218	220	253	240	216	195	166	136	136	142	137
1927 [2]	140	142	140	147	158	201	195	172	145	138	136	141
1928 [2]	144	153	174	179	181	168	156	137	127	114	109	108
1929 [2]	109	111	112	110	119	120	136	160	160	168	159	163
1930 [2]	167	168	169	187	193	193	173	149	148	127	114	108
1931 [2]	108	109	109	120	119	114	110	97	83	70	68	68
1932 [2]	70	68	73	78	80	82	83	79	68	59	57	59
MEAT ANIMALS												
1923	110	110	110	110	108	103	105	104	112	106	100	98
1924	101	102	104	106	107	105	103	116	115	121	115	113
1925	123	126	145	146	139	139	148	149	143	141	136	136
1926	140	146	147	146	148	154	152	144	148	148	142	140
1927	140	143	144	143	137	129	131	136	142	145	141	138
1928	138	139	139	142	151	150	157	162	174	160	150	143
1929	146	150	160	164	164	163	167	165	156	151	144	143
1930	146	150	151	146	142	141	127	119	128	123	118	112
1931	112	106	106	106	99	91	92	92	86	79	76	68
1932	68	65	69	66	59	57	72	69	67	60	57	52
DAIRY PRODUCTS												
1923	151	151	148	147	142	142	139	142	145	153	157	155
1924	152	150	146	134	128	126	123	120	126	130	132	137
1925	134	134	137	132	132	130	131	135	137	146	146	146
1926	147	143	141	133	130	128	129	128	133	134	141	144
1927	144	143	139	140	136	132	130	129	135	139	141	145
1928	145	145	142	139	136	134	134	135	141	143	144	146
1929	145	144	144	142	139	135	135	137	139	141	142	140
1930	135	129	126	126	123	118	115	117	123	125	124	117
1931	107	101	101	99	91	86	85	87	92	95	95	92
1932	85	79	76	74	69	62	63	65	67	68	68	69
POULTRY PRODUCTS												
1923	175	151	130	117	117	114	116	126	144	165	191	198
1924	162	157	109	105	109	115	121	132	153	176	203	217
1925	213	166	124	127	131	135	141	148	152	175	208	213
1926	172	145	128	133	135	138	137	137	155	173	202	212
1927	173	145	115	114	112	102	112	122	143	167	189	195
1928	177	144	122	121	128	127	134	140	156	168	185	197
1929	161	158	144	127	134	140	143	151	165	181	200	204
1930	178	154	115	117	110	103	101	107	125	129	146	127
1931	110	79	92	90	77	81	83	93	99	110	123	120
1932	87	70	61	60	60	59	65	75	84	102	115	121
COTTON AND COTTONSEED												
1923	203	215	224	222	211	207	199	190	204	221	238	253
1924	255	247	219	226	222	210	215	219	175	182	179	176
1925	182	183	195	189	184	183	186	186	178	171	144	139
1926	138	142	133	135	130	132	126	130	134	94	88	81
1927	85	94	102	101	113	119	125	136	179	169	162	153
1928	152	141	147	154	166	162	170	158	142	147	146	148
1929	148	149	155	152	148	146	145	146	146	141	132	130
1930	128	121	113	120	119	115	99	94	83	76	80	73
1931	72	76	80	78	74	85	71	53	47	42	50	45
1932	45	47	50	46	42	37	41	51	57	51	47	49

[1] Kafir omitted. [2] Onions and cabbage omitted.

TABLE 465.—*Index numbers of farm prices, United States, 1923–1932*—Continued

Group and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
ALL GROUPS	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1923	134	136	136	137	135	133	130	128	132	134	138	137
1924	137	136	131	130	129	130	132	139	132	138	137	130
1925	146	146	151	147	146	148	149	152	144	143	144	143
1926 [3]	143	143	140	140	139	139	136	133	134	130	130	127
1927 [3]	126	127	126	125	126	130	130	132	140	139	137	137
1928 [3]	137	135	137	140	148	145	145	139	141	137	134	134
1929 [3]	133	136	140	138	136	135	140	143	141	140	136	135
1930 [3]	134	131	126	127	124	123	111	108	111	106	103	97
1931 [3]	94	90	91	91	86	80	79	75	72	68	71	66
1932 [4]	63	60	61	59	56	52	57	59	59	56	54	52

Bureau of Agricultural Economics. Prices of farm production received by producers collected monthly *from a list of about 12,000 special price reporters. This list is made up almost entirely of country-town* dealers, elevator managers, buyers, and merchants. The commodities by groups are as follows: Grains—wheat, *corn, oats, barley, rye, kafir; fruits and vegetables*—apples, oranges, grapefruit, potatoes, sweetpotatoes, beans, onions, cabbage; meat animals—beef cattle, calves, hogs, sheep, lambs; dairy products—butter (represents butter, butterfat, and cream), milk; poultry products—chickens, eggs; cotton and cottonseed; all groups includes also horses (represents horses and mules), hay, flax, tobacco, and wool.

[4] Kafir, onions, and cabbage omitted.

TABLE 466.—*Index numbers of wholesale prices by groups of commodities, United States, 1900–1932* [1]

[1910-1914=100]

Calendar year	Farm products	Foods	Hides and leather products	Textile products	Fuel and lighting	Metals and metal products	Building materials	Chemicals and drugs	House furnishing goods	Miscellaneous	All commodities
	Index No.	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1900	71	70	77	95	88	115	84	101	90	93	82
1901	74	78	76	85	85	109	80	104	90	85	81
1902	82	83	79	88	98	107	82	106	90	80	86
1903	78	81	77	94	114	106	85	104	93	90	87
1904	82	84	77	94	101	94	82	104	92	100	87
1905	79	85	84	96	94	104	87	101	91	107	88
1906	80	83	90	104	99	120	98	95	94	105	90
1907	87	88	90	113	103	129	103	97	101	98	95
1908	87	91	86	97	102	101	94	98	94	89	92
1909	98	97	95	100	98	99	97	98	95	118	99
1910	104	101	93	104	90	100	100	101	99	139	103
1911	94	96	91	99	89	95	100	100	96	99	95
1912	102	104	100	99	98	105	101	99	97	97	101
1913	100	100	106	102	116	106	103	99	103	85	102
1914	100	100	110	97	107	94	96	100	104	82	99
1915	100	101	117	96	98	101	97	138	103	79	102
1916	118	117	145	125	141	137	122	198	112	91	125
1917	181	162	192	175	200	177	160	203	135	111	172
1918	208	185	195	244	207	160	179	224	171	122	192
1919	221	201	270	240	198	154	209	193	194	126	202
1920	211	213	266	293	311	175	272	203	260	152	225
1921	124	140	169	168	184	138	176	142	207	99	142
1922	132	138	162	178	204	121	176	124	190	84	141
1923	138	144	162	198	185	128	197	124	200	91	147
1924	140	141	157	190	175	125	185	122	192	85	143
1925	154	155	163	192	183	121	184	125	189	99	151
1926	140	155	155	178	190	117	181	123	183	91	146
1927	139	150	167	170	168	113	172	119	179	83	139
1928	148	157	188	170	160	114	170	118	174	78	141
1929	147	155	169	161	158	118	173	116	173	75	139
1930	124	140	155	143	149	108	163	110	170	71	126
1931	91	116	134	118	128	99	144	98	156	63	107
1932	68	95	113	98	133	94	129	90	138	58	95

Bureau of Agricultural Economics.

[1] Computed by reducing to a 1910-1914 base the Bureau of Labor Statistics series, 1926=100; the index numbers for each group on the 1926 base are divided by the monthly averages for 1910-1914. The averages used for each group are as follows: Farm products, 71.3; foods, 64.5; hides and leather products, 64.5; textile products, 56.3; fuel and lighting, 52.7; metals and metal products, 85.3; building materials, 55.2; chemicals and drugs, 81.2; house furnishing goods, 54.6; miscellaneous, 110.1; and all commodities, 68.5.

TABLE 467.—*Farm-wage rates: Averages and index numbers, 1909–1932*

[1910-1914=100]

Year	Average yearly farm wage [1] — Per month— With board	Average yearly farm wage [1] — Per month— Without board	Average yearly farm wage [1] — Per day— With board	Average yearly farm wage [1] — Per day— Without board	Weighted average wage rate per month [2]	Index numbers of farm wages	Year	Average yearly farm wage [1] — Per month— With board	Average yearly farm wage [1] — Per month— Without board	Average yearly farm wage [1] — Per day— With board	Average yearly farm wage [1] — Per day— Without board	Weighted average wage rate per month [2]	Index numbers of farm wages
	Dols.	*Dols.*	*Dols.*	*Dols.*	*Dols.*			*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	
1909	20.48	28.09	1.04	1.31	23.00	90	1921	30.25	43.58	1.66	2.17	35.77	150
1910	19.58	28.04	1.07	1.40	23.08	97	1922	29.31	42.09	1.64	2.14	34.91	146
1911	19.85	28.33	1.07	1.40	23.25	97	1923	33.09	46.74	1.91	2.45	39.64	166
1912	20.46	29.14	1.12	1.44	24.01	101	1924 [3]	33.34	47.22	1.88	2.44	39.67	166
1913	21.27	30.21	1.15	1.48	24.83	104	1925 [3]	33.88	47.80	1.89	2.46	40.12	168
1914	20.90	29.72	1.11	1.44	24.26	101	1926 [3]	34.86	48.86	1.91	2.48	40.88	171
1915	21.08	29.97	1.12	1.45	24.46	102	1927 [3]	34.58	48.63	1.90	2.46	40.60	170
1916	23.04	32.58	1.24	1.60	26.83	112	1928 [3]	34.66	48.65	1.88	2.43	40.44	169
1917	28.64	40.19	1.56	2.00	33.42	140	1929 [3]	34.74	49.06	1.88	2.42	40.52	170
1918	35.12	49.13	2.05	2.61	42.12	176	1930 [3]	31.14	44.59	1.65	2.16	36.24	152
1919	40.14	56.77	2.44	3.10	49.11	206	1931 [3]	23.60	35.03	1.22	1.65	27.61	116
1920	47.24	65.05	2.84	3.56	57.01	239	1932 [3]	17.53	26.67	.88	1.21	20.46	86

Bureau of Agricultural Economics.

[1] Yearly averages are from reports by crop reporters, giving average wages for the year in their localities.
[2] This column has significance only as an essential step in computing the wage index.
[3] Weighted average of quarterly reports, April (weight 1), July (weight 5), October (weight 5), and January of the following year (weight 1).

TABLE 468.—*Male farm labor, by geographic divisions, quarterly, 1932*

Division	Per month, with board				Per month, without board				Per day, with board [1]				Per day, without board [1]			
	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.
	Dols.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
North Atlantic	29.13	28.44	26.42	25.23	48.80	45.88	43.24	41.94	1.70	1.60	1.51	1.40	2.37	2.27	2.13	2.00
East North Central	21.97	21.90	20.32	19.40	33.80	32.07	29.93	28.86	1.17	1.14	1.06	1.02	1.63	1.56	1.44	1.36
West North Central	20.98	22.63	21.58	19.78	31.65	32.74	30.83	29.09	1.12	1.11	1.04	.99	1.55	1.58	1.43	1.36
South Atlantic	14.43	13.38	12.30	12.19	21.80	20.04	18.59	18.45	.74	.68	.62	.62	1.02	.91	.84	.84
South Central	14.76	13.37	12.65	12.75	21.90	20.24	18.84	18.85	.72	.67	.61	.61	.96	.90	.80	.82
Western	32.39	31.18	29.40	27.35	51.45	49.68	46.01	43.26	1.48	1.41	1.28	1.24	2.12	2.06	1.85	1.75
United States	19.77	19.19	18.00	17.29	30.53	29.13	27.10	26.36	1.02	.97	.89	.87	1.40	1.35	1.23	1.19

Bureau of Agricultural Economics. As reported by field and crop reporters.

[1] Includes piece work.

TABLE 469.—*Farm real estate: Index numbers of estimated value per acre, by geographic divisions, 1912–1932* [1]

[1912–1914=100 per cent]

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	Index No.	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*	*Index No.*
1912	99	98	97	97	98	97	96	98	94	97
1913	101	100	100	100	100	100	100	102	99	100
1914	100	102	103	103	103	103	104	100	106	103
1915	99	100	104	105	98	99	100	98	107	103
1916	102	104	110	114	108	109	103	98	111	108
1917	112	112	116	122	119	120	116	106	122	117
1918	117	117	127	134	135	140	134	117	120	129
1919	123	121	135	147	161	162	143	130	134	140
1920	140	136	161	184	198	199	177	151	156	170
1921	135	127	151	174	174	163	159	133	155	157
1922	134	118	132	150	146	149	136	122	151	139
1923	130	116	128	142	152	149	132	115	148	135
1924	128	114	121	132	151	142	136	110	147	130
1925	127	114	116	126	148	141	144	105	140	127
1926	128	113	111	121	149	139	144	103	144	124
1927	127	111	104	115	137	133	130	101	143	119
1928	127	110	101	113	134	130	137	101	142	117
1929	126	109	100	112	132	129	136	101	142	116
1930	127	106	96	109	128	128	136	102	142	115
1931	126	101	87	97	116	117	121	100	140	106
1932	116	96	73	81	96	97	97	82	118	89

Bureau of Agricultural Economics. Based on values as reported by crop reporters. Values as reported by the Census for 1910, 1920, and 1925 will be found in Table 511 of the 1927 Yearbook.

[1] All farm land with improvements, as of Mar. 1. Owing to rounding of figures, 1912–1914 will not always equal exactly 100 per cent.

TABLE 470.—*Number of farms per 1,000 changing ownership, by various methods, by geographic divisions, 12 months ended March 15, 1928–1932*

Method of sale and year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	Number per thousand	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*	*Number per thousand*
Voluntary sales and trades: [1]										
1928	34.9	33.7	24.0	23.9	20.0	27.5	27.9	34.8	34.3	26.3
1929	30.4	28.2	21.0	22.4	18.3	23.4	25.5	35.6	28.3	23.5
1930	30.7	28.3	20.8	22.9	18.2	23.9	24.2	38.7	30.1	23.7
1931	30.7	24.5	18.6	18.9	14.5	19.4	16.7	24.8	22.1	19.0
1932	24.8	20.4	16.8	14.2	12.3	17.2	15.4	17.6	22.3	16.2
Forced sales and related defaults:										
1928	10.7	11.8	20.7	32.4	23.3	20.0	18.5	39.4	19.9	22.8
1929	10.9	12.0	19.1	25.9	23.0	15.2	15.3	29.1	17.5	19.5
1930	11.2	13.1	22.3	27.5	23.2	16.1	16.8	20.4	15.2	20.8
1931	9.7	13.8	24.0	31.3	32.2	25.9	22.4	36.4	25.0	26.1
1932	15.5	18.0	34.3	52.5	47.1	50.6	40.2	43.5	37.6	41.7
Inheritance and gift:										
1928	10.4	8.6	9.7	8.4	10.6	9.2	7.8	5.6	7.1	8.9
1929	9.6	8.0	8.9	8.5	10.4	8.8	7.2	6.0	6.5	8.5
1930	10.3	8.2	9.4	9.8	11.4	9.3	7.6	7.0	7.3	9.3
1931	8.8	8.5	9.3	9.7	12.5	9.9	7.4	6.9	6.6	9.4
1932	10.2	9.0	11.0	9.8	13.3	11.1	8.8	7.8	7.5	10.4
Administrators' and executors' sales: [2]										
1928	7.1	8.2	8.3	6.5	7.9	6.6	4.2	3.7	4.4	6.7
1929	6.5	7.2	6.7	6.1	7.5	5.4	3.6	4.1	3.7	5.4
1930	6.1	7.0	7.8	6.2	7.9	5.8	3.3	4.7	3.6	6.1
1931	5.6	7.0	7.5	5.4	6.5	5.6	3.4	3.6	3.6	5.7
1932	6.9	6.1	8.1	4.9	8.1	6.2	4.9	4.5	4.3	6.2
Total, all classes: [3]										
1928	64.1	64.1	63.9	72.7	62.9	64.4	59.6	85.4	67.1	66.0
1929	58.2	56.6	57.0	64.1	60.3	53.7	52.5	76.2	57.5	58.0
1930	60.2	58.0	61.6	68.0	62.7	56.5	53.3	81.7	57.6	61.5
1931	56.1	55.5	60.9	66.8	68.3	62.6	51.6	72.8	58.1	61.9
1932	60.5	55.3	72.4	83.6	83.4	87.2	71.3	75.5	73.7	76.7

Bureau of Agricultural Economics. Based on returns from crop reporters.

[1] Including contracts to purchase (but not options).
[2] Includes all other sales in settlement of estates.
[3] Including miscellaneous and unclassified.

TABLE 471.—*Bankruptcies among farmers, number and percentage of total, by geographic divisions, fiscal years ended June 30, 1910–1932*

Year	New England: Bankruptcies among farmers	New England: Per cent of total bankruptcies	Middle Atlantic: Bankruptcies among farmers	Middle Atlantic: Per cent of total bankruptcies	East North Central: Bankruptcies among farmers	East North Central: Per cent of total bankruptcies	West North Central: Bankruptcies among farmers	West North Central: Per cent of total bankruptcies	South Atlantic: Bankruptcies among farmers	South Atlantic: Per cent of total bankruptcies
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
1910	123	6.0	52	1.8	98	3.2	287	15.9	63	4.5
1911	85	4.4	48	1.6	89	3.4	167	11.0	78	5.1
1912	148	7.4	58	1.7	78	2.7	219	14.2	79	4.7
1913	81	4.0	66	1.8	143	5.0	258	13.7	85	4.5
1914	88	4.0	63	2.0	91	2.8	289	14.6	100	4.5
1915	112	4.8	90	2.4	94	2.8	290	13.8	177	5.5
1916	143	5.3	88	2.0	146	3.9	276	12.6	369	9.8
1917	152	4.8	130	2.7	142	3.6	325	13.6	407	12.2
1918	125	4.3	97	2.4	126	3.6	267	11.4	410	13.8
1919	104	4.1	89	2.4	75	2.2	156	8.1	291	15.8
1920	72	3.8	67	2.2	83	3.3	213	12.0	169	10.1
1921	91	6.2	91	3.3	62	3.6	324	20.6	297	13.7
1922	92	4.9	77	2.6	247	9.0	1,066	40.3	678	17.0
1923	146	4.9	148	3.1	560	11.5	2,005	46.1	959	17.0
1924	196	5.8	171	3.2	684	12.2	2,785	42.5	1,085	16.9
1925	160	5.2	190	2.6	700	13.4	2,889	39.2	1,037	17.6
1926	145	4.6	224	3.4	844	11.3	2,813	35.4	747	12.7
1927	105	3.1	224	3.1	719	9.2	2,404	30.3	585	10.0
1928	162	3.5	274	3.5	874	9.3	1,729	24.2	685	9.9
1929	145	3.2	270	3.2	980	8.8	1,471	21.2	515	7.0
1930	141	2.8	305	3.6	973	8.0	1,257	19.2	491	5.9
1931	104	2.3	353	3.6	1,025	8.1	1,010	17.9	455	5.8
1932	186	3.8	372	3.8	1,580	10.7	1,009	20.5	467	5.7

Year	East South Central: Bankruptcies among farmers	East South Central: Per cent of total bankruptcies	West South Central: Bankruptcies among farmers	West South Central: Per cent of total bankruptcies	Mountain: Bankruptcies among farmers	Mountain: Per cent of total bankruptcies	Pacific: Bankruptcies among farmers	Pacific: Per cent of total bankruptcies	United States: Bankruptcies among farmers	United States: Per cent of total bankruptcies
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
1910	38	2.8	66	8.3	35	7.1	87	9.0	849	5.7
1911	65	5.3	72	8.2	35	7.0	40	4.2	679	4.8
1912	91	5.7	62	7.0	55	9.1	47	4.6	837	5.4
1913	83	4.1	89	7.4	66	8.9	71	5.4	942	5.4
1914	100	4.2	81	6.8	118	15.7	115	6.9	1,045	5.6
1915	127	4.4	97	9.3	159	19.2	100	5.9	1,246	5.9
1916	164	6.8	178	9.4	179	17.0	115	6.1	1,658	6.9
1917	184	6.8	217	12.2	193	17.4	156	7.3	1,906	7.5
1918	179	5.3	186	15.1	105	11.4	137	6.7	1,632	7.0
1919	126	5.6	164	14.9	102	11.9	100	5.8	1,207	6.3
1920	108	6.8	95	10.0	104	16.2	86	5.9	997	6.4
1921	100	3.9	124	15.7	177	23.8	97	7.2	1,363	9.0
1922	201	4.9	264	19.5	419	38.2	192	11.0	3,236	14.4
1923	420	9.1	539	20.4	730	43.3	424	16.3	5,940	17.4
1924	483	9.7	788	22.3	1,040	46.3	540	15.7	7,772	18.7
1925	517	9.7	650	23.6	1,071	41.8	589	14.6	7,872	17.8
1926	579	9.5	764	25.6	1,142	42.7	511	11.9	7,769	16.5
1927	615	9.7	567	20.7	609	31.8	468	10.0	6,296	13.1
1928	521	6.9	561	19.5	420	24.0	453	6.5	5,679	10.6
1929	352	4.5	484	17.3	335	20.9	357	6.1	4,939	8.7
1930	336	3.8	375	14.7	260	17.1	326	4.6	4,464	7.4
1931	338	3.6	282	10.5	201	13.3	255	4.4	4,023	6.7
1932	311	3.2	308	10.2	215	15.2	311	5.0	4,849	7.7

Bureau of Agricultural Economics. Compiled from annual reports of the Attorney General.

TABLE 472.—*Farm mortgage debt: Estimated total for all farms, by States, January 1, 1910–1932*

State and division	1910 [1]	1920	1925	1928	1930 [2]
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	13,210	20,890	26,097	25,252	24,823
New Hampshire	6,870	8,600	7,732	7,780	9,901
Vermont	15,650	29,040	28,001	28,322	33,102
Massachusetts	22,890	34,180	32,207	31,262	42,550
Rhode Island	2,210	2,350	2,435	2,455	3,854
Connecticut	16,080	25,800	27,276	27,423	30,514
New England	76,110	120,860	123,748	122,494	144,744
New York	154,190	224,000	226,770	219,812	247,633
New Jersey	31,720	39,500	41,741	40,370	56,884
Pennsylvania	95,620	133,080	120,281	116,432	174,037
Middle Atlantic	281,530	396,640	388,798	376,614	478,554
Ohio	113,320	210,760	214,409	222,101	259,630
Indiana	111,280	206,000	264,483	277,269	266,989
Illinois	268,780	502,860	650,353	685,365	631,266
Michigan	109,970	215,740	228,089	235,390	230,377
Wisconsin	193,600	455,470	504,553	529,992	502,549
East North Central	794,950	1,591,420	1,861,887	1,950,126	1,890,811
Minnesota	146,160	455,640	553,784	658,458	530,025
Iowa	431,500	1,098,970	1,424,352	1,402,178	1,098,610
Missouri	202,650	385,790	449,022	447,351	428,227
North Dakota	101,450	267,780	226,714	230,250	204,598
South Dakota	88,700	278,880	372,004	370,946	295,725
Nebraska	161,850	416,860	617,930	599,418	560,973
Kansas	163,770	295,870	482,596	447,586	487,122
West North Central	1,296,080	3,199,690	4,126,402	4,056,187	3,605,280
Delaware	6,500	8,990	8,695	9,469	11,841
Maryland	29,580	49,230	50,422	54,980	64,825
District of Columbia	290	340	304	354	642
Virginia	24,000	61,600	79,709	87,117	88,865
West Virginia	8,210	15,960	18,570	20,155	24,283
North Carolina	18,900	56,580	78,600	90,866	104,979
South Carolina	20,530	51,220	68,735	77,214	67,507
Georgia	28,800	83,840	109,060	123,305	100,845
Florida	4,380	19,710	25,508	28,436	45,140
South Atlantic	141,250	347,470	439,609	491,896	508,927
Kentucky	40,510	104,100	94,549	103,798	97,609
Tennessee	26,850	83,130	85,857	96,711	87,313
Alabama	24,880	55,450	66,410	69,488	83,764
Mississippi	31,320	77,420	109,562	111,500	96,864
East South Central	123,560	320,100	356,378	381,497	365,609
Arkansas	22,200	76,870	97,809	103,464	85,577
Louisiana	19,090	41,250	57,910	61,760	61,379
Oklahoma	77,680	188,890	218,963	228,513	214,033
Texas	172,240	396,670	485,587	507,515	543,951
West South Central	291,210	703,680	860,269	901,252	904,940
Montana	19,620	154,940	116,616	104,862	129,200
Idaho	24,270	115,350	107,355	100,033	106,908
Wyoming	7,820	32,970	43,364	40,922	42,948
Colorado	41,800	138,400	153,727	144,464	146,462
New Mexico	4,810	23,670	28,784	26,900	30,729
Arizona	4,660	31,790	29,545	29,006	28,743
Utah	7,170	35,550	39,152	36,367	46,273
Nevada	3,340	11,880	15,244	13,997	14,737
Mountain	113,710	544,550	533,787	496,551	546,000
Washington	45,040	116,740	121,371	120,523	131,299
Oregon	34,950	91,090	105,503	110,875	116,805
California	22,080	425,460	442,868	460,511	548,421
Pacific	202,070	633,290	669,742	691,909	796,525
United States	3,320,470	7,857,700	9,360,620	9,468,526	9,241,390

Bureau of Agricultural Economics.

[1] Revised. [2] Preliminary.

TABLE 473.—*Agricultural loans from selected Federal and other agencies, outstanding at close of year, 1917–1932*

End of year	Farm mortgage loans [1] by—				Federal intermediate credit bank loans to—	
	Federal land banks [2]	Joint-stock land banks [2]	Loans of 40 life insurance companies [3]	Member banks [4]	Cooperative associations [2]	Financing agencies [2]
	Million dollars	*Million dollars*	*Million dollars*	*Million dollars*	*Thousand dollars*	*Thousand dollars*
1917	[5] 30					
1918	156	8				
1919	294	60				
1920	350	78				
1921	433	85				
1922	639	219				
1923	800	393	1,335		33,627	9,105
1924	928	446	1,452		43,507	18,760
1925	1,006	546	1,523		53,780	26,272
1926	1,078	632	1,588	[6] 489	52,704	39,730
1927	1,156	667	1,618	[6] 478	31,991	43,924
1928	1,194	605	1,606	[6] 444	36,174	45,103
1929	1,197	585	1,591	388	26,073	50,018
1930	1,187	553	1,554	387	64,377	65,633
1931	1,163	530	1,512	359	45,255	74,613
1932	1,116	409	1,402	356	9,866	82,518

Bureau of Agricultural Economics.

[1] See Table 472 for total mortgage debt, by States.
[2] Federal Farm Loan Board. Beginning 1928 loans from joint-stock land banks in receivership not included.
[3] Association of Life Insurance Presidents. Reports cover operations of 40 companies representing 82 per cent of the admitted assets of all legal reserve life companies in the United States.
[4] Federal Reserve Board.
[5] Nov. 30.
[6] June 30.

TABLE 474.—*Selected interest and discount rates, and bond yields, 1917–1932*

Year	12 Federal land banks' rates to borrowers [1]	12 Federal intermediate credit banks' loan and discount rates [1]		Yield on Federal land bank bonds	Rates on commercial paper (4–6 months) (average) [2]	Federal reserve bank discount rates (New York) [2]
		Loans	Discounts			
	Average	*Average*	*Average*	*Average*	*Average*	*Range*
1917	5.05			4.33	4.74	4 –4½
1918	5.45			4.39	5.86	4½–4¾
1919	5.50			4.22	5.42	4¾
1920	5.50			5.14	7.46	4¾–7
1921	5.88			5.11	6.56	4½–7
1922	5.71			4.50	4.48	4 –4½
1923	5.50	5.50	5.50	4.39	5.01	4 –4½
1924	5.50	5.12	5.33	4.55	3.87	3 –4½
1925	5.46	4.59	5.04	4.34	4.03	3 –3½
1926	5.30	4.70	4.90	4.27	4.34	3½–4
1927	5.11	4.51	4.73	4.08	4.10	3½–4
1928	5.05	4.81	4.91	4.26	4.85	3½–5
1929	5.32	5.56	5.61	4.78	5.84	4½–6
1930	5.63	4.53	4.54	4.70	3.58	2½–4½
1931	5.63	4.08	4.08	5.34	2.63	1½–3½
1932	5.61	4.23	4.23	5.59	2.73	2½–3½

Bureau of Agricultural Economics.

[1] Federal Farm Loan Board. [2] Federal Reserve Board.

TABLE 475.—*Studies of farm family living: Data from 9,796 families in 25 States for one year in the period 1922–1932*

State, county, and locality	Key	Year of study	Families studied	Average size of family	Average value of family living	Average value of goods and services furnished by the farm: Food	Housing	Other	Total	Average expenditures for goods and services purchased: Food	Clothing	Household operation [1]	Transportation	Other	Total	Average savings: Life insurance	Other
			Number	*Persons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine:																	
Eight counties	2R	1930–31	83	[2] 4.5	(3)	[4] 222	(3)	(3)	(3)	289	135	111	(3)	371	906	(3)	(3)
Ten counties	2R	1931–32	90	[3] 4.8	(3)	[4] 214	(3)	(3)	(3)	245	89	83	(3)	251	608	(3)	(3)
New Hampshire: Merrimack	4S	1924	40	3.2	[6] 1,839	[7] 335	[8] 212	[7] 83	630	381	244	121	[9] 86	345	1,177	32	(3)
Vermont:																	
Franklin	3S	1923–24	86	4.3	[6] 1,553	[7] 400	[8] 188	[7] 107	695	280	178	88	[9] 62	213	821	37	(3)
Addison, Chittenden, Lamoille, Washington	3R	1926–27	13	4.8	2,256	[4] 381	[10] 248	[4] 100	727	388	199	176	[11] 140	452	1,355	80	94
Scattered counties	2R	1927–1930	74	4.0	[6] 1,881	[4] 372	[8] 248	[4] 133	753	318	159	125	[11] 73	367	1,042	86	(3)
Massachusetts: Franklin, Middlesex	4S	1923–24	81	3.8	[6] 1,948	[7] 368	[8] 223	[7] 113	704	401	246	109	[9] 77	369	1,202	42	(3)
Connecticut: New London	4S	1923	110	4.3	[6] 1,559	[7] 303	[8] 200	[7] 97	600	377	228	67	[9] 47	209	928	31	(3)
New York: Tompkins	2S	1927–28	195	3.6	[12] 1,520	[13] 279	[14] 129	[12, 13] 87	[12] 495	280	163	107	66	235	831	22	172
Ohio:																	
Delaware	4S	1922–23	383	4.1	[6] 1,541	[7] 346	[8] 255	[7] 39	640	224	238	84	[9] 99	229	874	27	(3)
Vinton, Jackson, Meigs	4S	1926	300	3.9	[6] 933	[13] 322	[8] 67	[13] 12	401	135	156	41	45	142	519	13	(3)
Mahoning, Warren	3R	1926–27	5	5.8	2,280	[4] 418	[10] 461	[4] 21	900	322	215	200	[11] 106	435	1,278	101	1
Scattered counties	2R	1926–1928	117	[2] 4.5	(3)	[13] 291	(3)	[13] 15	(3)	228	197	124	143	350	1,042	84	1,015
Illinois:																	
Coles, Marshall	3R	1926–1927	3	3.3	2,008	[4] 406	[10] 231	[4] 1	638	262	164	212	[11] 169	430	1,237	72	61
Scattered counties	2R	1929–30	70	3.7	2,489	[4] 402	[8] 412	[4] 18	832	234	195	189	[11] 238	479	1,335	(15)	[15] 322
Do	2R	1930–31	111	3.8	2,190	[4] 327	[8] 296	(15)	[16] 623	220	175	[16] 182	[11] 160	479	[16] 1,236	(15)	[15] 331
Do	2R	1931–32	159	3.9	1,791	[4] 361	[8] 267	[4] 17	645	195	123	138	[11] 103	315	872	(15)	[15] 274
Wisconsin: Seven counties	4S	1928–1930	900	4.3	[6] 1,454	[13] 231	[8] 221	[13] 45	497	289	194	129	91	216	919	38	(3)
Minnesota:																	
Scattered counties	2S	1924–25	157	4.7	(3)	(3)	(3)	(3)	(3)	324	231	100	[11, 17] 212	284	[17] 1,151	38	541
Pine	4R	1925	25	5.6	1,953	[13] 244	[8] 230	[13] 41	515	359	141	[18] 35	(18)	271	806	8	624
Localities of potato, dairy, corn, small-grain, and general farming	2S	1924–1926	488	[19] 3.7	(3)	(3)	(3)	(3)	(3)	279	198	87	[11, 17] 208	303	[17] 1,075	(15)	[15] 438
Scattered counties	2S	1925–26	65	[19] 3.8	(3)	(3)	(3)	(3)	(3)	326	262	235	277	334	1,434	70	537
Southern dairy and northwestern grain and potato sections	2S	1927–28	226	[19] 3.8	(3)	(3)	(3)	(3)	(3)	337	229	190	[11, 17] 248	360	[17] 1,370	63	995
Iowa:																	
Boone, Story, Sac	4S	1922–23	472	4.4	[6] 1,669	[7] 400	[8] 256	[7] 37	693	222	243	91	[9] 108	254	918	58	(3)
Five counties	2R	1922–1924	10	3.5	(3)	[13] 242	(3)	(3)	(3)	201	177	140	93	316	927	(3)	(3)
Vicinities of Ames, Oelwein, Corning	2R	1926–1929	147	4.5	1,625	[4] 400	[20] 267	[4] 26	693	241	154	112	[11] 81	261	849	67	16
Missouri: Six counties	4S	1922–23	178	4.0	[6] 1,897	[7] 528	[8] 256	[7] 50	834	196	268	92	[9] 105	344	1,008	55	(3)

See footnotes at end of table.

TABLE 475.—*Studies of farm family living: Data from 9,796 families in 25 States for one year in the period 1922–1932*—Continued

State, county, and locality	Key	Year of study	Families studied	Average size of family	Average value of family living	Average value of goods and services furnished by the farm: Food	Housing	Other	Total	Average expenditures for goods and services purchased: Food	Clothing	Household operation	Transportation	Other	Total	Average savings: Life insurance	Other
			Number	*Persons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
North Dakota: Scattered counties	4R	1923–1925	56	5.1	2,482	[13] 363	[8] 190	[13] 11	564	280	173	218	([4])	215	892	52	974
Nebraska: Washington, Lancaster, Clay, Kimball	3S	1923–24	340	4.3	[6] 1,681	[13] 484	[8] 204	[13] 62	750	242	202	53	124	260	881	50	([3])
Kansas: Riley, Pratt, Sedgwick, Cherokee	4S	1922–23	406	4.4	[6] 1,492	[7] 404	[8] 174	[7] 27	605	225	201	73	[9] 85	265	849	38	([3])
Maryland: Frederick	3R	1926–27	10	3.9	2,937	[4] 709	[10] 272	[4] 42	1023	271	273	248	[11] 254	618	1,664	167	83
Virginia: Culpepper, Bedford	2S	1928–29	137	4.5	[6] 1,687	[21] 516	[8] 265	([16])	[16] 781	119	238	[16] 162	[11] 128	227	[16] 874	32	([3])
North Carolina: Wake	2S	1926	594	4.6	([3])	[4] 425	([3])	[4] 58	([3])	140	228	15	[11] 154	262	805	28	124
South Carolina: Five counties	4S	1924–25	202	5.2	[6] 1,482	[7] 504	[8] 138	[7] 57	690	169	233	60	[9] 70	207	739	44	([3])
Kentucky:																	
Mason	4S	1922–23	370	4.1	[6] 1,493	[7] 422	[8] 212	[7] 16	650	172	223	95	[9] 111	209	810	33	([3])
Laurel	4S	1927–28	203	4.8	[6] 689	[13] 308	[8] 44	[13] 13	305	114	93	[19] 36	([19])	78	321	3	([3])
Grayson	4S	1928–29	138	4.1	[6] 736	[13] 244	[8] 72	[13] 28	344	89	140	13	28	110	380	12	([3])
Knott	1S	1929–30	228	6.1	[21] 972	[13] 422	[8] 34	[13] 61	517	166	163	26	1	95	450	5	([22])
Alabama: Eight counties	4S	1923–24	558	4.9	[6] 1,615	[7] 580	[8] 125	[7] 43	748	182	257	63	[9] 73	251	826	41	([3])
Arkansas:																	
Faulkner	2S	1924	385	[2] 5.5	1,085	[21] 433	[8] 108	[21] 42	583	134	135	31	([5])	157	487	([15])	[15] 15
Five counties	2S	1924	903	([3])	([3])	482	([3])	([3])	([3])	153	125	16	([5])	133	427	([3])	([3])
Faulkner	2S	1925	219	([3])	([3])	492	([3])	([3])	([3])	128	114	0	([5])	112	363	([3])	([3])
Do.	2S	1926	259	([3])	([3])	580	([3])	41	([3])	114	98	6	([5])	97	315	([3])	([3])
Montana: Seven counties	2R	1929–30	40	4.0	[23] 2,534	[4] 604	[8] 226	([3])	[23] 830	341	189	158	[11] 307	402	1,397	([15])	[15] 307
Idaho: Franklin	5S	1930–31	100	4.9	[6] 1,454	[7] 296	[8] 110	[7] 41	447	256	251	84	118	272	981	26	([3])
Utah: Summit	2R	1930	51	6.0	[24] 1,559	[13] 258	[25] 168	([3])	426	247	218	132	[11] 120	342	1,059	74	([3])

Bureau of Home Economics.

Key.—The numbers indicate the agency which obtained the data and the letters indicate the method used in obtaining the data, as follows:

1=Bureau of Home Economics, U. S. Department of Agriculture.
2=State university, agricultural college, or agricultural experiment station.
3=Bureau of Home Economics, U. S. Department of Agriculture, in cooperation with State or other university, agricultural college, or agricultural experiment station.
4=Bureau of Agricultural Economics, U. S. Department of Agriculture, in cooperation with State or other university, agricultural college, or agricultural experiment station.
5=Other agencies, including independent studies.

[8] Evaluated at 10 per cent of estimated value of house.
[9] Transportation expenses estimated on the basis of regional averages and subtracted from *operation expenditures as published*.
[10] Evaluated at 10 per cent of the value of the houses occupied by tenants, and at 6 per cent of estimated equity in the houses occupied by owners.
[11] Automobile only.
[12] Computed figure.
[13] Goods furnished by the farm evaluated at farm prices.
[14] Evaluated at 6 per cent of estimated value of house plus 2 per cent depreciation.
[15] Life insurance included with other savings.
[16] Value of fuel furnished by farm included with household operation expenditures.
[17] Includes farm operation of automobile.

S = Schedule method of obtaining data.
R = Record or account-book method of obtaining data.

[1] Includes expenditures for fuel, light, household supplies, and hired help; in some cases includes also those for laundry done outside, telephone, postage, express and freight, insurance on furniture, dry-cleaning and pressing, moving charges, interest on family debts, ice, and water.

[2] Size of household

[3] Not included in this report.

[4] Goods furnished by the farm evaluated at retail prices.

[5] *Not given separately.*

[6] Includes life insurance but no other savings.

[7] Goods furnished by the farm evaluated by averaging farm and retail prices.

[18] Automobile for family use included with household operation expenditures.

[19] Size of family in adult-equivalent units.

[20] Estimated on basis of investment, appearance, and condition of house and prevailing rents in section.

[21] Goods furnished by the farm evaluated at wholesale prices.

[22] Figures on savings other than life insurance not yet available.

[23] Not including value of fuel furnished.

[24] Excludes savings other than life insurance and value of furnished fuel which this report does not cover, and depreciation on house furnishings and automobile which the report includes in value of living.

[25] Estimated on basis of taxes and insurance, depreciation for one year and interest on investment.

MISCELLANEOUS AGRICULTURAL STATISTICS

TABLE 476.—*Temperature: Normal[1] and 1932, by months, at selected points in the United States*

Station	January Normal	January 1932	February Normal	February 1932	March Normal	March 1932	April Normal	April 1932	May Normal	May 1932	June Normal	June 1932
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.
Greenville, Me	12.2	22.8	13.0	14.0	24.8	21.2	36.5	37.2	49.4	51.7	58.6	59.8
Burlington, Vt	18.8	20.8	19.4	21.4	29.1	25.1	43.3	39.5	56.5	55.8	65.7	63.6
Boston, Mass	27.9	38.8	28.8	30.6	35.6	35.6	46.4	47.4	57.1	60.2	66.5	66.4
Buffalo, N. Y	24.6	37.2	24.3	31.3	31.1	28.5	42.8	39.8	54.6	53.2	64.4	64.7
Canton, N. Y	16.3	28.9	18.0	20.4	27.7	23.0	42.5	37.6	56.2	55.6	65.1	64.0
Trenton, N. J	30.5	43.4	30.7	36.8	39.1	36.8	40.8	49.2	61.1	61.0	69.5	70.3
Pittsburgh, Pa	30.7	41.9	32.3	38.3	39.6	33.6	51.2	48.9	62.4	61.6	70.7	71.0
Scranton, Pa	26.6	39.5	27.3	32.4	35.7	32.1	48.1	45.1	59.4	59.2	67.8	67.3
Cincinnati, Ohio	30.3	41.4	32.8	42.6	40.9	36.2	52.4	52.6	63.1	64.2	71.2	73.4
Cleveland, Ohio	26.5	40.2	27.4	35.8	34.6	31.0	46.2	44.0	57.9	58.7	67.1	69.1
Evansville, Ind	33.5	43.3	36.3	46.2	45.9	39.6	56.7	57.4	66.7	66.8	75.1	77.6
Indianapolis, Ind	28.4	38.8	31.1	39.6	40.0	33.3	52.1	51.6	62.9	63.3	71.6	73.8
Fort Wayne, Ind	26.1	36.8	26.8	35.3	38.1	29.8	49.0	47.4	60.1	60.6	68.5	71.0
Chicago, Ill	23.7	33.6	26.3	35.0	35.3	30.1	46.9	46.4	57.5	59.6	67.3	70.6
Peoria, Ill	23.1	33.2	25.9	36.8	37.0	31.8	50.9	51.4	61.7	63.7	70.9	73.4
Cairo, Ill	34.9	44.1	38.5	48.6	47.2	42.7	58.1	60.3	68.4	68.4	76.3	78.2
Grand Rapids, Mich	24.5	34.2	23.7	31.8	33.4	28.4	47.0	45.0	58.0	59.4	67.8	70.5
Alpena, Mich	19.1	31.6	18.0	25.1	25.5	24.6	38.6	37.6	50.5	51.4	60.4	62.4
Marquette, Mich	16.3	27.4	16.3	21.8	24.8	23.2	37.8	37.2	49.0	51.0	58.9	61.3
Madison, Wis	16.7	25.9	19.1	27.1	30.6	24.4	45.4	44.6	57.6	58.6	67.2	70.4
Green Bay, Wis	15.7	25.7	17.4	23.3	28.6	24.4	43.2	41.8	54.9	55.9	64.9	68.5
Duluth, Minn	7.9	17.4	11.4	13.4	23.7	17.2	37.0	37.7	47.3	51.7	57.2	6.00
St. Paul, Minn	12.6	18.0	15.8	19.4	29.1	22.4	45.6	46.6	57.9	59.0	67.1	72.2
Des Moines, Iowa	20.1	24.5	23.7	32.0	35.9	30.4	50.1	51.4	61.3	63.8	70.6	73.6
Dubuque, Iowa	19.1	26.5	22.2	30.7	34.0	27.2	48.6	48.2	60.3	62.1	69.4	72.1
St. Louis, Mo	31.1	39.8	34.8	44.6	44.1	38.8	56.1	68.0	67.0	68.0	75.0	77.6
St. Joseph, Mo	26.5	29.0	31.7	38.8	42.7	34.6	54.1	56.3	64.0	66.0	73.5	74.8
Springfield, Mo	33.5	38.8	35.2	46.2	45.2	40.1	56.0	58.9	64.5	65.5	72.5	74.2
Bismarck, N. Dak	7.8	9.8	10.3	15.7	24.2	20.5	42.1	46.8	54.5	56.5	63.7	67.5
Devils Lake, N. Dak	1.8	7.4	5.1	10.5	19.8	16.2	38.8	41.8	52.6	54.6	61.9	67.6
Pierre, S. Dak	16.0	14.6	18.6	22.8	31.5	26.4	46.8	51.7	58.0	61.6	68.5	71.2
North Platte, Nebr	22.9	22.8	26.6	32.8	36.6	30.9	48.6	52.6	58.7	63.2	67.5	70.2
Omaha, Nebr	21.9	21.2	25.5	30.8	37.0	31.4	51.2	54.1	62.4	64.8	71.6	74.2
Concordia, Kans	26.4	23.4	29.8	35.4	41.0	34.0	53.5	56.2	63.2	65.3	73.0	74.3
Dodge City, Kans	29.0	26.3	33.2	41.4	42.8	36.6	53.6	56.5	63.5	66.0	72.5	73.0
Iola, Kans	29.8	34.5	33.2	43.4	44.5	38.6	56.2	59.2	65.2	66.2	74.1	75.5
Washington, D. C	33.4	46.8	35.3	42.9	42.6	40.0	53.3	52.6	63.7	64.2	72.2	73.2
Lynchburg, Va	37.5	48.2	40.3	47.8	47.3	43.4	57.3	56.2	67.3	66.0	74.6	74.0
Norfolk, Va	40.6	52.8	42.7	49.4	48.2	46.4	56.8	56.3	66.2	65.2	74.4	75.4
Parkersburg, W. Va	32.5	43.9	34.2	42.6	42.8	37.6	53.4	52.0	63.8	64.0	71.4	73.1

Station	July Normal	July 1932	August Normal	August 1932	September Normal	September 1932	October Normal	October 1932	November Normal	November 1932	December Normal	December 1932	Annual Normal	Annual 1932
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.
Greenville, Me	65.1	62.6	62.2	65.9	52.0	57.1	45.0	47.1	31.2	34.9	18.4	23.6	39.0	41.5
Burlington, Vt	70.3	66.4	67.9	68.4	60.3	60.2	49.2	50.8	36.3	33.2	24.4	20.4	45.1	45.3
Boston, Mass	71.7	72.8	69.0	74.0	63.2	65.2	53.6	57.1	42.0	42.8	32.5	38.1	49.6	52.4
Buffalo, N. Y	69.8	67.0	68.6	69.7	62.4	63.6	51.9	53.6	39.4	37.4	29.8	32.2	47.0	48.2
Canton, N. Y	68.9	66.1	66.6	68.2	59.3	59.4	47.2	49.9	33.9	31.9	22.7	27.8	43.7	44.4
Trenton, N. J	74.5	74.6	73.0	75.4	66.9	67.6	55.6	57.0	44.4	43.0	34.4	37.4	52.5	54.4
Pittsburgh, Pa	74.6	73.0	72.9	73.4	66.4	67.8	55.7	55.5	43.2	41.2	34.2	35.6	52.8	53.5
Scranton, Pa	71.7	71.0	69.8	71.6	62.9	64.0	51.9	54.0	40.5	38.4	30.7	33.2	49.4	50.6
Cincinnati, Ohio	75.1	77.1	73.6	74.4	67.1	67.7	55.7	55.8	42.5	41.2	33.4	34.2	53.2	55.1
Cleveland, Ohio	71.4	72.0	70.0	72.7	63.9	66.2	53.6	55.1	40.9	40.4	31.2	33.9	49.2	51.6
Evansville, Ind	78.9	81.2	77.4	77.8	70.7	70.1	59.4	57.5	46.6	42.8	37.1	35.8	57.0	58.0
Indianapolis, Ind	75.7	77.2	73.7	75.2	66.9	66.7	55.7	54.6	42.3	38.0	32.2	32.4	52.7	53.7
Fort Wayne, Ind	73.7	74.4	71.2	72.9	65.1	64.0	53.6	52.8	40.8	35.6	28.7	29.8	50.1	50.9
Chicago, Ill	72.5	74.7	71.6	73.7	65.2	64.4	54.0	52.6	40.1	37.2	28.8	28.8	49.1	50.6
Peoria, Ill	75.4	76.7	72.5	74.2	64.3	64.8	52.0	52.8	37.5	36.0	28.1	27.8	49.9	51.9
Cairo, Ill	79.6	81.5	77.8	79.0	71.5	70.2	60.4	58.2	47.3	43.8	37.8	37.2	58.2	59.4
Grand Rapids, Mich	72.3	73.0	69.7	72.8	62.7	62.8	51.2	51.6	38.4	36.5	28.5	29.4	48.1	49.6
Alpena, Mich	65.9	66.8	64.1	67.6	57.6	57.8	47.1	47.2	34.4	33.3	24.8	26.4	42.2	44.3
Marquette, Mich	64.9	65.8	63.8	67.6	57.5	60.3	46.7	45.1	33.3	30.9	22.6	21.4	41.0	42.8
Madison, Wis	72.1	73.7	69.8	71.2	62.4	61.9	50.3	48.0	35.2	32.0	22.8	22.4	45.8	46.7
Green Bay, Wis	70.0	71.5	67.7	70.9	60.4	60.6	48.5	47.0	34.0	31.8	22.3	21.8	44.0	45.3
Duluth, Minn	63.9	66.2	62.6	67.6	55.1	56.7	44.1	41.4	30.0	25.7	15.9	12.0	38.0	38.9
St. Paul, Minn	72.1	74.6	69.4	72.2	61.3	61.0	48.6	46.4	32.5	30.6	19.0	16.6	44.2	44.9
Des Moines, Iowa	75.4	77.4	73.1	73.0	65.6	63.2	53.4	50.3	38.4	33.2	26.0	22.6	49.5	49.6
Dubuque, Iowa	74.1	76.0	71.7	72.3	64.0	61.9	51.9	46.8	37.0	33.6	24.7	23.5	48.1	48.6
St. Louis, Mo	78.8	81.6	77.5	77.8	70.5	69.6	58.8	57.4	45.4	41.0	34.9	34.2	56.2	57.4
St. Joseph, Mo	78.7	79.6	76.8	77.6	68.7	66.8	56.6	53.4	43.3	38.0	30.7	27.5	53.9	53.5
Springfield, Mo	76.8	79.0	75.7	78.3	68.9	69.6	58.2	56.9	45.7	41.6	36.2	34.2	55.7	56.9
Bismarck, N. Dak	69.8	72.0	67.3	69.7	58.1	58.4	44.9	40.2	28.5	28.8	14.7	15.7	40.5	41.6
Devils Lake, N. Dak	67.4	68.5	64.8	67.6	55.9	56.3	42.4	36.7	24.5	23.6	9.5	11.0	37.0	38.5
Pierre, S. Dak	75.3	78.0	72.8	75.7	63.8	64.3	49.8	45.6	33.6	36.4	21.8	19.2	46.4	47.3
North Platte, Nebr	72.9	78.3	70.8	76.3	62.1	63.8	49.7	48.4	36.6	39.8	26.7	21.1	48.3	50.0
Omaha, Nebr	76.7	79.2	74.4	75.0	66.8	65.4	54.3	52.6	38.5	36.6	26.4	23.8	50.6	50.8
Concordia, Kans	78.0	81.0	76.5	77.7	68.3	66.6	55.9	53.6	41.4	39.6	30.7	25.8	53.1	52.7
Dodge City, Kans	78.4	82.7	77.7	79.4	69.4	68.8	56.1	54.5	42.6	41.8	32.6	28.0	54.3	54.6
Iola, Kans	78.2	81.6	77.1	80.6	69.8	72.2	57.8	58.4	44.1	42.3	33.9	32.4	55.3	57.1
Washington, D. C	76.8	77.4	75.0	77.8	68.1	70.3	57.4	58.0	45.2	44.7	36.6	39.6	55.0	57.3
Lynchburg, Va	77.5	79.2	75.6	77.3	69.0	69.8	58.5	58.8	47.2	45.1	39.5	41.2	57.6	58.9
Norfolk, Va	78.7	79.2	77.4	78.8	71.6	72.8	62.5	63.4	51.4	51.6	43.1	47.4	59.5	61.6
Parkersburg, W. Va	75.4	74.9	73.9	74.1	67.3	69.1	56.1	56.9	43.8	41.9	35.2	36.0	54.2	55.5

Lexington, Ky	32.9	42.8	35.4	44.6	43.7	37.0	54.3	53.9	64.3	64.0	72.2	73.8	75.9	77.0	74.5	75.6	68.5	69.0	57.4	56.2	44.8	42.6	35.8	36.6	55.0	56.1
Charlotte, N. C	41.2	51.9	43.9	51.5	50.4	49.0	59.8	60.3	68.9	68.5	75.5	77.5	78.4	81.6	77.1	78.6	71.5	72.0	61.7	62.6	50.6	48.0	43.0	46.6	60.2	62.3
Wilmington, N. C	46.5	57.3	47.9	55.9	53.3	51.8	62.0	61.8	70.8	68.8	76.8	76.8	79.1	81.6	77.6	79.1	73.1	73.9	65.3	66.6	56.0	54.3	49.1	53.8	63.1	65.1
Charleston, S. C	49.9	60.0	52.4	60.0	57.4	55.4	64.5	66.2	72.7	72.6	78.9	79.0	81.4	83.8	81.0	80.7	76.6	76.4	67.8	69.2	58.1	56.8	51.7	56.6	66.0	68.1
Greenville, S. C	40.3	51.4	43.3	52.6	49.9	49.6	58.6	61.3	67.2	68.0	74.1	70.2	76.9	81.8	75.8	77.6	70.6	72.0	60.2	62.4	49.6	48.6	42.2	46.4	59.1	62.3
Atlanta, Ga	42.6	51.2	46.3	53.2	52.0	48.8	61.0	61.9	69.9	67.6	76.0	76.9	78.1	80.6	77.0	78.4	72.4	71.8	63.0	61.4	52.1	47.8	44.7	47.6	61.2	62.3
Thomasville, Ga	52.7	60.2	54.5	64.4	61.1	56.4	67.1	67.9	74.4	73.8	80.7	79.2	81.2	83.2	81.0	80.6	77.7	77.0	68.4	68.0	59.0	56.0	52.9	60.6	67.6	68.9
Jacksonville, Fla	55.4	64.2	58.0	66.0	62.6	59.2	68.7	68.7	75.0	74.9	79.9	78.8	82.1	84.0	81.7	81.2	78.3	78.0	71.1	71.5	62.2	60.0	56.3	62.7	69.3	70.8
Miami, Fla	66.5	71.6	67.1	73.1	70.2	68.7	72.8	72.6	76.4	76.0	80.0	81.3	81.0	83.8	81.4	82.1	80.1	81.8	77.0	79.0	71.8	69.8	68.0	72.0	74.4	76.0
Memphis, Tenn	40.9	48.5	44.3	53.8	52.3	47.8	61.8	64.2	70.6	70.7	77.6	79.8	80.7	82.6	79.4	81.7	73.6	73.4	63.3	61.6	51.7	47.4	43.6	40.7	61.6	62.7
Nashville, Tenn	38.6	46.4	41.6	51.3	49.2	44.4	59.0	59.7	68.2	67.5	75.6	77.8	79.1	81.1	77.8	79.9	71.8	72.0	61.0	58.0	49.0	46.6	41.0	40.9	59.3	60.5
Birmingham, Ala	45.1	51.9	48.0	56.7	55.4	50.4	63.3	64.8	71.1	69.9	77.9	79.2	80.2	82.4	79.2	80.7	74.8	73.8	64.8	62.4	53.9	49.4	46.4	49.0	63.3	64.2
Mobile, Ala	51.5	57.5	54.7	63.8	59.7	55.6	66.3	68.0	74.4	72.7	80.3	81.6	81.4	84.6	81.0	82.1	78.1	77.6	69.3	66.4	58.6	54.2	52.2	55.3	67.3	68.3
Meridian, Miss	47.0	53.0	49.6	60.3	57.1	52.6	64.0	66.1	71.3	69.7	78.1	79.4	80.4	82.8	79.5	81.2	74.5	74.3	64.3	62.1	54.2	50.5	47.7	47.9	64.0	65.0
Vicksburg, Miss	48.2	54.2	51.8	60.0	58.5	53.4	65.6	67.2	72.9	71.6	79.0	81.0	81.3	83.6	80.8	82.0	76.3	75.3	66.7	63.7	56.6	51.4	50.0	46.4	65.6	65.8
New Orleans, La	54.2	60.7	57.3	67.2	62.8	58.8	68.8	69.9	75.4	74.1	80.6	82.2	82.4	85.2	82.2	83.0	79.2	70.4	71.0	69.2	61.6	56.2	55.6	57.6	69.3	70.3
Shreveport, La	47.0	52.7	50.9	59.4	58.3	54.0	65.8	67.7	73.6	73.4	80.7	82.8	83.2	86.1	82.0	84.8	76.9	77.8	68.6	65.9	56.0	52.4	49.1	45.6	65.8	66.9
Amarillo, Tex	35.3	35.2	38.1	49.1	46.9	44.0	55.8	59.0	64.1	67.3	72.8	72.6	76.8	80.2	75.7	78.0	69.3	68.9	57.7	58.3	45.5	47.1	37.0	30.7	60.3	57.5
Brownsville, Tex	59.8	63.8	62.6	69.3	68.2	62.8	73.7	73.3	78.6	77.2	82.4	82.0	83.6	83.7	83.9	84.2	80.6	80.4	74.9	73.9	67.2	63.8	61.2	58.4	73.1	72.7
El Paso, Tex	45.0	42.8	49.0	53.2	55.8	52.2	63.4	65.1	71.5	73.2	79.6	81.0	81.1	83.0	79.2	80.8	73.9	73.9	63.5	62.6	52.7	53.2	44.9	43.2	63.3	63.7
Fort Worth, Tex	45.4	48.2	48.3	56.8	57.7	54.1	65.0	67.4	72.3	72.2	79.9	80.8	83.6	84.8	83.0	84.8	70.9	76.0	66.7	65.8	55.5	52.4	47.5	43.4	65.2	65.6
Galveston, Tex	53.8	58.4	56.3	65.0	62.4	58.2	68.7	69.0	74.8	75.8	80.7	81.2	83.4	84.4	83.0	84.4	80.1	80.0	72.7	71.0	63.3	58.3	56.4	53.4	69.6	69.9
San Antonio, Tex	52.3	55.4	55.4	63.0	62.8	57.4	69.1	70.4	75.1	75.4	81.0	82.2	83.8	85.2	83.5	84.1	79.0	77.3	70.5	69.2	60.3	57.8	53.7	50.2	68.9	69.0
Oklahoma City, Okla	36.4	39.8	39.6	49.6	50.0	45.5	59.8	63.5	67.7	69.4	76.0	76.8	80.6	83.5	79.7	81.4	72.8	73.4	61.5	60.4	48.8	45.8	39.3	36.0	59.4	60.4
Little Rock, Ark	41.4	48.0	44.9	53.3	53.0	49.4	62.1	65.4	70.3	70.6	77.4	79.8	80.9	83.6	79.8	82.8	74.1	74.4	63.6	61.8	52.1	47.4	44.2	40.2	62.0	63.1
Havre, Mont	12.9	18.4	13.6	20.6	27.1	22.0	43.7	47.7	53.4	57.2	62.0	64.8	68.3	70.2	65.4	68.6	56.4	57.4	44.5	42.6	31.2	31.6	20.4	19.8	41.6	43.4
Miles City, Mont	14.5	15.2	16.8	23.2	28.6	25.6	44.7	49.4	56.7	59.3	66.0	68.4	72.9	75.6	71.5	73.0	61.2	60.0	46.5	42.0	30.9	34.5	21.0	17.0	44.3	45.3
Kalispell, Mont	20.4	19.7	23.3	25.7	32.9	28.6	43.6	44.2	51.4	52.6	57.7	61.2	64.1	65.8	62.8	65.2	53.5	54.8	43.5	42.2	32.4	37.4	24.9	20.8	42.5	43.2
Cheyenne, Wyo	25.5	21.4	27.3	32.2	33.1	25.8	40.9	43.0	50.3	52.2	60.4	60.3	66.7	70.0	65.6	67.4	57.0	58.2	44.8	42.9	34.8	38.9	28.5	18.8	44.6	44.3
Sheridan, Wyo	18.8	15.2	22.0	24.0	31.3	25.8	43.4	45.8	52.0	55.2	61.0	62.2	67.8	70.1	66.2	69.6	56.2	57.1	44.4	39.8	32.4	36.2	22.5	15.7	43.2	43.1
Pueblo, Colo	29.9	28.2	32.9	41.8	41.6	36.6	50.1	52.4	59.2	62.6	69.0	69.0	74.2	78.6	72.7	76.0	64.6	65.1	52.0	52.0	39.4	42.2	31.5	22.4	51.4	52.2
Grand Junction, Colo	24.0	21.8	32.9	37.2	43.6	40.9	52.4	52.9	61.1	63.6	71.4	69.8	77.7	77.6	75.4	76.0	66.2	67.2	52.8	52.0	39.3	39.3	27.5	22.3	52.0	51.7
Santa Fe, N. Mex	28.8	22.9	33.1	37.7	39.7	36.7	46.7	48.1	55.7	55.6	64.8	63.4	69.0	69.6	67.4	68.2	60.9	60.7	50.4	47.4	38.9	40.0	30.7	25.2	48.8	48.0
Roswell, N. Mex	39.2	38.8	42.5	50.0	51.3	45.8	60.6	60.3	69.4	67.0	76.3	76.2	78.9	80.0	76.6	77.6	70.3	67.6	59.5	50.6	48.1	47.2	41.2	34.7	59.5	58.5
Phoenix, Ariz	51.2	47.0	55.1	56.8	60.7	61.9	67.0	69.2	75.0	77.3	84.5	85.0	89.8	91.8	88.5	92.1	82.7	87.0	70.6	71.5	59.7	63.0	52.0	49.3	69.7	71.0
Modena, Utah	26.7	16.2	31.0	27.4	38.2	39.3	46.0	46.0	53.5	54.4	63.3	62.7	70.6	70.6	69.2	69.4	60.0	62.0	48.0	48.6	36.4	41.0	28.1	17.6	47.6	46.3
Salt Lake City, Utah	29.2	23.9	33.8	32.9	41.7	39.9	49.6	50.4	57.4	59.8	67.4	67.8	75.7	76.7	74.5	75.4	64.4	66.8	52.5	51.1	41.1	45.0	31.9	23.2	51.6	51.1
Winnemucca, Nev	28.6	23.4	33.5	22.0	40.0	40.9	46.7	46.6	53.9	54.8	62.8	65.8	70.6	70.7	69.3	68.4	59.2	63.8	48.3	48.0	38.4	42.0	30.0	21.5	48.4	47.3
Boise, Idaho	29.8	27.2	34.8	31.0	42.7	40.8	50.4	51.4	57.1	58.4	65.3	67.2	72.9	73.0	71.8	70.8	61.9	64.1	51.1	50.9	41.0	42.7	32.1	25.4	50.9	50.2
Seattle, Wash	39.5	38.8	41.1	40.9	44.9	46.4	49.4	50.7	54.5	54.8	59.0	61.8	63.1	61.1	63.1	63.2	58.1	60.5	51.4	54.1	45.6	48.8	41.7	35.8	51.0	51.7
Walla Walla, Wash	32.7	33.1	37.1	37.4	46.1	45.6	53.1	54.2	59.6	59.2	66.5	70.2	74.0	71.8	72.7	72.6	63.8	66.0	53.5	55.9	42.8	47.9	35.5	32.2	53.1	53.8
Portland, Oreg	39.4	39.8	42.1	41.4	46.9	48.0	51.8	53.2	56.9	57.6	62.4	65.8	66.7	65.8	66.7	68.0	61.7	65.6	54.2	57.2	46.8	49.3	41.2	39.1	53.1	54.2
Roseburg, Oreg	41.2	39.6	43.4	42.7	47.1	50.0	51.0	51.0	56.0	56.0	62.5	65.2	67.4	65.4	68.0	67.8	62.9	64.2	53.9	55.9	45.9	50.4	41.8	37.6	53.4	53.8
Eureka, Calif	46.9	44.4	47.2	45.9	48.3	50.4	49.9	49.7	52.0	52.6	54.3	54.2	55.5	56.2	56.0	56.8	55.9	54.4	53.6	52.6	51.1	52.6	48.2	44.2	51.6	51.2
Fresno, Calif	46.2	44.8	51.1	50.7	55.0	58.4	60.2	60.2	67.1	68.9	75.8	76.9	82.1	80.4	80.7	79.6	73.4	77.8	64.0	66.1	54.2	60.0	46.2	43.2	63.0	63.9
Los Angeles, Calif	54.6	53.3	55.5	56.5	57.5	62.2	59.4	62.6	62.2	63.6	66.4	66.2	70.2	69.1	71.1	69.6	69.0	68.3	65.3	67.2	60.9	69.0	56.6	55.2	62.4	63.8
Sacramento, Calif	45.8	44.0	50.1	48.6	54.3	57.1	58.1	56.8	63.3	64.2	69.4	71.6	73.2	73.4	72.9	73.4	69.3	74.6	62.9	64.1	53.6	59.0	46.2	41.5	59.9	60.7
San Diego, Calif	54.3	52.2	55.1	55.6	56.7	59.0	58.5	60.2	60.8	61.8	63.9	63.8	67.2	65.6	68.7	66.0	67.1	65.6	63.7	63.2	59.7	64.2	56.0	54.3	61.0	61.0
San Francisco, Calif	49.9	49.3	52.2	51.4	54.2	57.1	55.0	56.0	56.8	58.4	58.5	59.2	58.5	59.7	59.1	61.0	60.9	63.0	60.5	62.2	56.3	60.6	51.3	47.4	56.1	57.1

Weather Bureau.

[1] Normals are based on records of 30 or more years of observations.

TABLE 477.—*Precipitation: Normal*[1] *and 1932, by months, at selected points in the United States*

Station	January		February		March		April		May		June		July		August		September		October		November		December		Annual	
	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932	Normal	1932
	Ins.	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Greenville, Me	2.81	2.50	2.88	1.70	3.12	3.50	2.95	4.25	3.43	2.66	3.93	1.38	4.72	3.44	3.63	4.13	4.08	9.66	3.91	2.83	3.46	5.01	3.17	1.66	42.09	42.72
Burlington, Vt	1.76	2.15	1.57	1.19	2.04	3.06	2.15	2.82	2.85	1.75	3.38	2.49	3.50	8.08	3.37	1.87	3.48	1.87	2.97	6.06	2.66	3.83	1.88	1.88	31.61	37.05
Boston, Mass	3.61	4.24	3.37	1.74	3.57	5.28	3.34	1.67	3.18	1.63	2.89	2.05	3.49	2.10	3.62	4.24	3.14	4.50	3.15	7.18	3.33	5.24	3.45	1.78	40.14	41.65
Buffalo, N. Y	3.30	4.97	2.95	2.21	2.57	3.35	2.56	2.52	3.10	3.45	2.82	1.47	3.03	4.32	3.08	1.83	2.92	1.67	3.29	3.26	3.02	4.50	3.36	2.70	36.00	36.25
Canton, N. Y	2.50	3.68	2.27	2.05	2.50	4.08	2.18	4.50	3.00	1.57	3.29	2.82	3.50	3.54	3.65	4.28	3.35	1.03	3.03	5.57	3.16	4.18	2.69	2.52	35.12	39.82
Trenton, N. J	3.31	4.18	3.27	1.51	3.40	5.59	2.94	2.25	3.08	3.08	3.09	3.49	3.94	3.63	4.75	5.55	3.40	2.70	2.78	4.69	2.73	7.53	3.35	3.05	40.04	47.25
Pittsburgh, Pa	3.05	4.80	2.62	.82	3.03	3.24	2.92	1.16	3.21	3.03	3.81	0.78	4.05	2.01	3.23	1.72	2.58	.59	2.52	2.79	2.29	3.22	2.86	1.73	36.17	25.89
Scranton, Pa	3.03	3.35	3.04	3.03	3.20	4.34	2.77	.59	3.27	2.73	3.67	3.24	4.03	2.18	3.69	2.60	3.17	1.33	3.03	5.10	2.77	4.40	3.02	1.12	38.69	34.01
Cincinnati, Ohio	3.48	4.73	2.99	1.79	3.89	3.22	3.12	1.80	3.70	.94	3.66	5.48	3.31	6.04	3.41	4.18	2.65	4.88	2.51	3.28	2.85	2.01	2.98	4.01	38.55	42.36
Cleveland, Ohio	2.51	3.46	2.51	1.10	2.71	3.39	2.44	2.09	3.12	3.71	3.12	1.88	3.45	2.42	2.77	4.31	3.33	1.45	2.78	3.06	2.64	2.63	2.44	3.77	33.82	33.27
Evansville, Ind	3.74	7.76	3.24	2.03	4.19	3.60	3.90	2.55	3.86	.99	4.04	1.79	3.42	3.31	3.36	3.34	3.31	7.34	2.82	4.85	3.74	2.11	3.54	7.52	43.16	47.19
Indianapolis, Ind	2.95	6.10	2.73	1.47	3.93	1.96	3.62	2.77	3.89	.60	3.62	5.94	3.34	2.86	3.31	3.17	3.40	7.18	2.78	3.25	3.35	2.69	2.98	4.70	39.90	42.60
Fort Wayne, Ind	2.33	3.84	2.35	.80	3.22	1.97	3.07	2.21	3.85	1.21	3.57	3.10	3.60	2.15	3.11	1.14	3.00	5.70	2.60	4.59	2.88	1.18	2.58	4.72	36.22	32.61
Chicago, Ill	1.90	2.20	2.14	1.21	2.58	3.10	2.78	.58	3.54	2.89	3.30	4.79	3.33	4.67	3.21	3.08	3.14	1.12	2.53	3.52	2.37	2.24	2.04	2.46	32.86	31.88
Peoria, Ill	1.78	2.51	2.01	1.40	2.73	2.51	3.38	1.99	4.06	3.61	3.77	4.75	3.58	3.41	3.12	3.14	4.03	1.78	2.29	3.18	2.37	.94	1.77	4.46	34.89	33.68
Cairo, Ill	3.76	7.02	3.13	4.43	3.75	4.19	3.72	3.28	3.71	.50	3.83	1.78	3.07	2.58	3.02	3.79	2.89	5.67	2.76	3.56	3.68	2.65	3.40	6.88	40.72	46.33
Grand Rapids, Mich	2.35	3.07	2.24	1.16	2.48	2.37	2.77	.98	3.44	4.95	3.48	2.37	2.92	4.15	2.61	2.22	3.53	.91	2.81	4.99	2.77	1.62	2.57	2.68	33.97	31.37
Alpena, Mich	1.89	2.67	1.71	1.73	1.99	.95	2.24	2.11	3.05	4.07	3.30	1.19	2.76	1.87	2.86	2.45	2.98	1.94	2.71	5.31	2.60	.86	2.08	1.96	30.17	27.11
Marquette, Mich	2.33	2.86	1.90	1.99	2.28	2.00	2.43	2.06	2.96	3.42	3.22	.87	3.12	4.26	2.67	3.66	3.25	1.80	2.76	1.93	2.91	1.43	2.60	1.60	32.47	27.94
Madison, Wis	1.38	1.04	1.50	.74	2.07	1.38	2.77	1.04	3.85	3.67	3.76	3.15	3.88	4.06	3.21	2.51	3.72	.18	2.43	3.68	1.78	1.42	1.63	1.89	31.98	24.76
Green Bay, Wis	1.54	2.15	1.56	1.23	2.04	.95	2.65	1.28	3.52	2.79	3.70	1.76	3.46	2.21	3.18	1.26	3.52	1.21	2.54	1.58	2.16	1.01	1.71	2.18	31.58	19.61
Duluth, Minn	.97	1.31	1.05	.48	1.54	.86	2.06	3.09	3.25	3.00	3.91	1.72	3.76	1.84	3.18	4.18	3.31	.68	2.31	1.66	1.45	3.10	1.15	.71	27.94	22.63
St. Paul, Minn	.92	1.94	.92	.96	1.43	1.45	2.35	2.39	3.27	2.11	4.14	2.20	3.57	3.86	3.01	2.76	3.07	.72	2.20	1.08	1.30	2.29	1.06	1.80	27.24	23.56
Des Moines, Iowa	1.07	1.83	1.12	.92	1.78	1.19	2.91	1.00	4.56	2.68	4.76	3.40	3.50	2.76	3.52	8.40	3.67	2.11	2.60	1.19	1.43	2.22	1.22	1.60	32.04	29.30
Dubuque, Iowa	1.30	1.21	1.38	.56	2.03	2.73	2.86	1.81	4.22	3.02	4.31	4.09	3.94	2.15	3.24	3.96	4.01	1.71	2.48	2.00	1.70	1.03	1.44	1.70	32.90	25.97
St. Louis, Mo	2.34	2.50	2.56	1.59	3.38	1.33	3.81	3.19	4.34	2.09	3.82	2.45	2.98	5.30	2.99	8.68	3.46	2.15	2.72	4.28	2.83	2.08	2.21	2.37	37.44	38.01
St. Joseph, Mo	1.05	1.30	1.38	.69	2.04	1.52	3.02	2.82	4.24	3.21	4.94	6.09	3.68	4.06	3.50	3.82	3.87	2.67	2.69	1.22	1.63	.59	.97	1.41	33.01	29.40
Springfield, Mo	2.34	3.79	2.35	.54	3.39	2.52	3.86	3.26	5.19	3.18	4.68	10.08	4.21	3.88	4.09	3.14	3.52	.55	3.05	4.86	2.79	3.17	2.31	4.83	41.78	43.80
Bismarck, N. Dak	.45	.35	.44	.20	.89	.73	1.52	2.08	2.32	3.78	3.35	2.57	2.24	1.38	1.82	.61	1.23	.33	.94	2.05	.57	.16	.57	.17	16.34	14.41
Devils Lake, N. Dak	.47	.35	.50	.40	.78	.72	1.52	2.58	2.03	2.24	3.56	4.16	2.57	3.87	2.48	1.23	1.63	.68	1.25	2.88	.72	.77	.54	.14	18.05	20.02
Pierre, S. Dak	.46	.17	.46	.12	.86	.98	1.81	2.34	2.49	4.84	2.96	2.91	2.68	1.08	2.09	2.09	1.10	.79	.82	1.25	.47	.02	.50	.28	16.70	16.87
North Platte, Nebr	.39	.41	.53	.39	.86	.54	2.06	1.80	2.78	1.11	3.22	2.75	2.74	6.69	2.39	2.10	1.35	.71	1.07	1.03	.47	T.	.53	.27	18.39	17.80
Omaha, Nebr	.70	2.80	.89	.97	1.37	.85	2.51	1.79	3.77	4.29	4.56	4.79	3.54	2.84	3.05	12.26	3.21	1.98	2.17	1.36	1.07	.56	.93	.71	27.77	35.20
Concordia, Kans	.61	1.24	.88	.59	1.23	.83	2.36	1.43	4.18	2.21	4.41	6.07	3.78	3.43	2.91	6.63	2.60	2.02	1.97	2.43	.99	.04	.63	.31	26.55	27.23
Dodge City, Kans	.41	1.28	.77	.37	.89	.91	1.94	1.08	2.89	1.20	3.30	4.46	3.14	2.38	2.67	2.60	1.90	2.35	1.30	.71	.73	.15	.57	.22	20.51	17.71
Iola, Kans	1.32	1.67	1.67	1.27	2.62	1.24	3.49	2.94	4.70	1.64	5.47	5.01	3.75	5.56	3.49	1.19	4.93	2.31	2.99	1.38	1.83	.93	1.39	2.68	37.65	27.82
Washington, D. C	3.55	4.82	3.27	2.46	3.75	6.45	3.27	2.12	3.70	5.07	4.13	2.84	4.71	2.43	4.01	1.36	3.24	4.24	2.84	7.40	2.37	6.43	3.32	3.93	42.16	49.55
Lynchburg, Va	3.43	4.29	3.15	1.25	3.54	4.80	2.95	1.01	3.63	1.38	3.79	2.54	4.21	.75	3.78	1.70	3.31	2.22	3.15	8.86	2.33	4.63	3.26	3.85	40.53	37.28
Norfolk, Va	3.10	4.53	3.23	2.15	3.77	3.13	3.23	1.63	3.81	2.48	4.22	3.26	5.75	3.21	5.22	1.60	3.23	1.51	3.04	3.96	2.16	2.34	3.34	3.70	44.09	33.50
Parkersburg, W. Va	3.58	4.20	3.13	1.58	3.49	3.72	3.19	1.69	3.38	1.22	4.00	4.05	4.29	6.42	3.51	2.49	2.76	.94	2.48	2.46	2.57	2.71	3.03	2.51	39.41	33.99
Lexington, Ky	4.18	8.46	3.62	3.01	4.32	4.95	3.50	3.32	3.81	.60	4.05	6.80	3.65	2.58	3.45	8.96	3.07	2.76	2.59	2.28	3.34	2.09	3.77	2.33	43.35	48.14
Charlotte, N. C	4.00	4.09	4.18	2.52	4.17	5.39	3.31	2.05	3.63	3.32	4.22	7.01	5.10	3.73	5.07	4.44	2.99	1.96	2.95	7.52	2.57	2.43	3.86	5.31	46.05	49.77

Wilmington, N. C	3.29	2.57	3.26	1.93	3.17	3.94	2.66	.91	3.44	5.14	5.10	3.85	7.13	4.28	6.36	3.16	4.51	5.44	3.27	5.42	1.96	6.51	2.78	2.88	46.93	46.01
Charleston, S. C	3.02	.98	2.98	1.17	3.02	2.62	2.53	.31	3.00	5.64	4.59	6.59	6.89	4.03	6.53	6.42	4.53	7.18	3.27	6.98	2.14	2.24	2.72	.68	45.22	44.84
Greenville, S. C	4.87	6.82	5.18	3.74	5.16	5.41	3.72	2.68	4.03	2.02	4.55	4.96	5.36	3.18	5.50	2.97	3.68	2.79	3.12	12.68	3.18	3.78	4.84	10.86	53.18	61.89
Atlanta, Ga	4.95	4.58	4.79	5.52	5.30	4.53	3.61	3.17	3.47	1.80	3.74	5.31	4.65	2.80	4.45	2.30	2.99	3.52	2.59	6.90	3.03	2.96	4.70	11.60	48.27	54.99
Thomasville, Ga	4.10	5.49	4.46	1.72	4.09	4.86	3.34	.51	3.63	6.95	5.45	8.02	6.70	9.21	5.75	9.60	4.88	7.39	2.96	8.86	2.68	3.12	4.31	1.47	52.35	70.20
Jacksonville, Fla	2.80	.40	2.97	1.12	2.91	5.05	2.38	3.20	4.02	2.25	5.33	23.32	6.71	6.92	5.81	4.26	7.35	6.61	4.46	2.62	1.98	5.55	3.02	.49	49.74	61.79
Miami, Fla	2.52	2.24	1.83	.86	2.17	1.85	3.09	2.48	6.22	15.40	6.86	8.49	5.42	.48	6.17	15.05	8.34	8.92	8.44	17.43	2.91	6.14	1.69	.56	55.66	79.90
Memphis, Tenn	4.81	11.87	4.36	5.37	5.26	4.28	4.78	2.53	4.19	.58	3.55	4.16	3.18	5.20	3.36	2.27	2.80	5.66	2.68	3.06	4.24	4.15	4.51	6.97	47.72	56.10
Nashville, Tenn	4.76	7.74	4.13	5.80	5.11	4.89	4.13	7.20	3.87	1.32	4.00	2.91	3.88	3.40	3.71	1.70	3.42	4.32	2.49	4.94	3.50	1.88	4.20	4.43	47.20	50.53
Birmingham, Ala	5.52	6.20	5.06	7.95	6.70	5.23	4.81	3.45	3.95	2.38	4.46	6.70	5.17	4.75	4.26	7.73	3.38	5.12	2.42	7.27	3.31	4.73	5.14	13.85	53.18	75.36
Mobile, Ala	4.85	4.55	5.33	2.54	5.98	3.33	4.63	3.76	4.32	10.59	5.43	2.66	6.89	6.14	6.92	8.53	5.00	10.76	3.60	10.08	3.64	2.41	5.02	4.90	61.01	70.25
Meridian, Miss	5.32	6.19	5.45	3.40	5.23	5.58	4.78	2.96	4.32	4.14	4.55	2.92	4.89	4.18	4.54	4.06	2.96	5.65	2.39	8.76	3.32	2.10	5.23	8.93	52.98	58.87
Vicksburg, Miss	5.37	0.96	4.82	4.12	5.57	6.64	5.19	2.21	4.32	1.40	3.99	2.02	4.53	2.24	3.46	1.77	2.87	5.78	2.77	5.52	3.71	4.10	5.33	11.82	51.93	57.58
New Orleans, La	4.34	5.25	4.25	2.54	4.72	2.54	5.24	5.88	4.60	15.06	5.88	3.73	6.37	6.57	5.80	8.21	5.03	6.14	3.30	8.43	3.14	3.62	4.79	4.15	57.46	72.12
Shreveport, La	3.93	10.51	3.29	5.90	4.11	5.95	4.63	2.61	4.22	1.34	3.50	3.27	3.56	1.04	2.70	1.58	2.80	.61	2.69	1.17	3.65	1.98	4.29	7.01	43.37	42.97
Amarillo, Tex	.51	1.69	.71	.41	.71	.42	1.83	2.21	2.79	1.02	2.84	9.24	2.84	1.22	3.08	.70	2.30	2.79	1.66	.64	.92	.02	.80	.87	20.99	21.14
Brownsville, Tex	1.50	1.48	1.21	1.80	1.26	2.39	1.43	6.59	2.27	.56	2.87	3.48	1.96	.17	2.55	1.12	5.52	9.88	3.29	6.36	1.98	.59	1.56	.75	27.40	35.17
El Paso, Tex	.46	.17	.41	.68	.36	.03	.26	T	.33	1.46	.58	.15	1.99	2.28	1.70	2.14	1.25	2.85	.80	.53	.50	0	.52	.65	9.16	10.94
Fort Worth, Tex	2.05	9.07	1.76	4.92	2.32	.63	4.02	3.43	4.65	6.03	3.35	3.04	2.61	2.07	2.62	2.92	2.49	10.80	2.81	1.66	2.58	1.56	1.87	4.90	33.13	51.03
Galveston, Tex	3.41	6.67	2.83	4.46	2.68	1.10	3.06	2.17	3.42	1.56	4.37	1.82	3.71	1.89	4.28	4.85	5.57	5.47	4.36	1.30	3.33	2.51	3.75	2.82	44.77	36.62
San Antonio, Tex	1.46	3.30	1.65	1.86	1.84	1.05	3.19	2.61	3.20	2.10	2.46	1.94	2.17	5.52	2.42	6.71	3.05	8.77	2.23	.60	1.90	.10	1.61	1.01	27.18	35.57
Oklahoma City, Okla	1.19	4.92	1.11	1.33	1.98	.39	3.29	.93	4.88	5.50	3.67	14.12	2.86	2.40	2.89	2.74	3.05	1.20	2.86	1.89	1.87	.10	1.50	4.86	31.15	40.38
Little Rock, Ark	4.73	11.38	3.84	4.81	4.62	5.23	5.19	1.70	4.78	3.23	3.76	3.70	3.50	7.76	3.75	1.25	3.17	2.65	2.71	3.34	4.19	1.23	4.14	6.40	48.38	52.68
Havre, Mont	.73	.20	.50	.62	.51	.80	.99	1.69	2.04	2.08	2.86	5.24	1.87	1.07	1.22	1.75	1.29	.38	.67	.66	.61	.71	.61	.11	13.90	15.31
Miles City, Mont	.66	.76	.49	.36	.86	.85	1.12	3.44	2.24	.72	2.66	2.29	1.54	1.37	1.08	2.09	1.04	.16	.90	2.32	.57	.16	.63	.51	13.79	15.03
Kalispell, Mont	1.57	1.18	1.11	.65	.95	1.75	.80	1.06	1.45	1.96	2.06	.50	1.10	.68	.87	1.85	1.24	.15	1.06	1.35	1.35	1.34	1.45	.96	15.02	13.43
Cheyenne, Wyo	.42	.31	.64	.61	1.02	1.40	1.99	1.67	2.43	1.47	1.61	1.64	2.10	.97	1.55	.63	1.20	1.13	.96	.41	.52	.20	.55	.82	14.99	11.28
Sheridan, Wyo	.85	1.31	.70	.11	1.16	1.65	1.92	2.73	2.65	3.35	2.04	3.55	1.22	.60	.91	.78	1.27	1.15	1.07	3.27	.63	.61	.64	.42	15.06	19.53
Pueblo, Colo	.31	.52	.47	.05	.59	.62	1.31	1.47	1.60	.32	1.36	1.50	1.94	1.77	1.82	1.32	.75	.23	.66	.54	.36	.30	.50	.59	11.67	9.23
Grand Junction, Colo	.60	.31	.58	.54	.76	.76	.83	1.24	.81	.16	.40	.45	.61	1.85	1.17	1.09	.92	.11	.95	.17	.57	T	.63	.89	8.83	7.57
Santa Fe, N. Mex	.67	.93	.75	.74	.80	.41	1.00	1.28	1.26	1.27	1.08	1.82	2.38	2.07	2.28	3.36	1.45	1.97	1.18	.96	.68	T	.74	.55	14.27	15.36
Roswell, N. Mex	.53	.05	.57	.65	.74	1.38	.89	.51	1.09	1.67	1.67	1.33	2.26	2.06	2.15	4.52	2.11	4.98	1.42	.57	.85	T	.66	.31	14.94	18.83
Phoenix, Ariz	.80	.10	.77	2.12	.68	.05	.40	.05	.12	0	.07	.23	1.07	.11	.95	.10	.75	.34	.47	1.73	.70	0	1.00	1.84	7.78	6.67
Modena, Utah	.85	.41	.95	2.19	1.03	.26	.89	.25	.79	1.01	.32	1.12	1.08	1.12	1.29	.69	.78	.76	.74	.29	.59	.04	.83	1.26	10.14	9.40
Salt Lake City, Utah	1.31	1.27	1.51	.99	1.98	1.51	2.05	2.04	1.92	.78	.80	1.41	.51	.52	.85	2.70	.98	T	1.44	1.06	1.35	.79	1.43	1.81	16.13	14.88
Winnemucca, Nev	1.03	1.43	.91	.70	.96	1.04	.84	1.26	.88	1.65	.72	1.09	.21	.27	.20	.23	.41	.01	.62	.06	.68	.10	1.08	.86	8.54	8.70
Boise, Idaho	1.73	1.09	1.44	1.04	1.35	2.93	1.18	1.75	1.43	1.92	.92	.55	.24	.91	.19	T	.53	.02	1.24	.40	1.28	1.48	1.57	1.00	13.10	13.09
Seattle, Wash	4.94	3.55	3.89	3.98	3.05	3.55	2.38	2.48	1.87	.58	1.33	.17	.63	1.88	.70	1.18	1.77	.23	2.84	3.10	5.03	8.76	5.60	4.82	34.03	34.28
Walla Walla, Wash	1.96	1.51	1.76	1.86	1.61	3.43	1.51	.94	1.61	1.31	1.12	.06	.39	.33	.49	T	.95	.05	1.53	1.48	2.02	3.07	2.06	.72	17.01	14.76
Portland, Oreg	6.60	5.63	5.36	2.58	3.91	6.08	2.87	3.57	2.19	1.50	1.52	.07	.61	.48	.64	.45	1.98	.11	3.12	3.76	6.10	7.88	6.72	7.87	41.62	39.98
Roseburg, Oreg	5.31	4.27	4.49	1.04	3.28	3.79	2.27	2.67	1.93	3.13	1.09	.46	.32	.08	.34	T	1.27	.06	2.61	1.67	4.66	4.64	5.34	4.74	32.91	26.55
Eureka, Calif	7.11	6.84	6.48	1.20	5.23	4.54	3.33	4.87	1.80	1.41	.72	.11	.11	.14	.18	.03	1.01	.01	2.33	1.32	5.18	5.11	6.28	5.54	39.76	31.12
Fresno, Calif	1.73	1.87	1.43	1.09	1.58	.83	.95	.22	.44	.40	.08	0	.01	0	.01	0	.21	T	.57	0	.93	.30	1.45	.98	9.39	5.69
Los Angeles, Calif	3.10	2.94	3.07	5.33	2.78	.01	1.04	.30	.45	.02	.08	.13	.01	T	.02	0	.17	.14	.68	.08	1.20	0	2.63	1.77	15.23	10.72
Sacramento, Calif	3.72	1.09	3.02	1.76	2.57	.34	1.51	.76	.77	.30	.15	T	0	T	0	0	.38	0	.92	0	1.88	.36	3.03	2.11	17.95	6.72
San Diego, Calif	2.06	1.45	2.03	5.15	1.72	.42	.77	.50	.35	.01	.05	.01	.03	T	.04	0	.06	0	.54	1.10	.76	.30	1.87	2.40	10.30	11.34
San Francisco, Calif	4.54	3.23	3.85	3.00	3.14	.86	1.61	.47	.80	.65	.18	.03	.02	T	.01	0	.45	0	1.12	.01	2.35	1.00	3.95	2.75	22.02	12.00

Weather Bureau.

T.=Trace, indicates an amount too small to measure.

[1] Normals are based on records of 20 or more years of observations.

TABLE 478.—*Frost: Dates of killing frosts, with length of growing season*

Station	Date of last killing frost in spring, 1932	Date of first killing frost in fall, 1932	Averages and extremes of killing frost for 30 to 51 years: Spring frosts		Fall frosts		Length of growing season between average dates of killing frosts
			Latest date	Average date	Earliest date	Average date of first	
							Days
Greenville, Me.	May 24[1]	Oct. 1[1]	June 23	May 30	Aug. 26	Sept. 14	107
Portland, Me.	Apr. 28	Oct. 14	June 20	Apr. 19	Sept. 11	Oct. 17	181
Concord, N. H.	May 24	...do...	June 5	May 7	Sept. 6	Oct. 3	149
Northfield, Vt.	June 8	Oct. 1	June 29	May 22	Aug. 26	Sept. 18	119
Boston, Mass.	Apr. 17	Nov. 4	May 16	Apr. 14	Sept. 26	Oct. 26	195
Hartford, Conn.	Apr. 17[1]	...do...	May 12	Apr. 20	Sept. 11	Oct. 14	177
Albany, N. Y.	...do...	Oct. 14	May 30	Apr. 24	Sept. 15	Oct. 15	174
Buffalo, N. Y.	Apr. 27	Nov. 3	May 23	Apr. 28	Oct. 2	Oct. 22	177
Canton, N. Y.	May 5	Sept. 30	June 2	May 4	Sept. 11	Sept. 30	149
Setauket, N. Y.	Apr. 17[1]	....	May 17	Apr. 16	Oct. 21	Nov. 10	208
Syracuse, N. Y.	Apr. 27[1]	Nov. 3	May 5	Apr. 23	Sept. 21	Oct. 22	182
Atlantic City, N. J.	Apr. 17[1]	Nov. 14	Apr. 30	Apr. 10	Oct. 1	Nov. 5	209
Trenton, N. J.	Apr. 15	Nov. 4	May 12	Apr. 16	Oct. 11	Oct. 24	191
Erie, Pa.	...do...	Nov. 3	May 17	Apr. 20	Oct. 9	Nov. 1	195
Harrisburg, Pa.	Apr. 17[1]	Nov. 4	May 12	Apr. 9	Oct. 3	Apr. 9	202
Pittsburgh, Pa.	May 3	Oct. 22	May 29	Apr. 23	Sept. 19	Oct. 21	181
Scranton, Pa.	Apr. 17	Sept. 30	May 12	Apr. 21	Sept. 14	Oct. 14	176
Cincinnati, Ohio	Apr. 27	Nov. 2	Apr. 27	Apr. 8	Sept. 30	Oct. 23	198
Cleveland, Ohio	...do...	Nov. 11	May 21	Apr. 16	Oct. 2	Nov. 3	201
Columbus, Ohio	Apr. 27	...do...	May 17	Apr. 18	Sept. 21	Oct. 19	184
Dayton, Ohio	...do...	...do...	May 25	Apr. 19	Sept. 30	Oct. 20	184
Toledo, Ohio	Apr. 14	Nov. 1	May 29	Apr. 22	Sept. 9	Oct. 18	179
Evansville, Ind.	Mar. 15	Nov. 11	Apr. 26	Apr. 5	Oct. 9	Oct. 29	207
Fort Wayne, Ind.	Apr. 17	...do...	May 28	Apr. 25	Sept. 14	Oct. 13	171
Indianapolis, Ind.	Apr. 13	Oct. 30	May 25	Apr. 16	Sept. 21	Oct. 20	187
Cairo, Ill.	Mar. 18	Nov. 2	Apr. 30	Mar. 31	Sept. 30	Oct. 29	212
Chicago, Ill.	Apr. 13	Nov. 11	May 25	Apr. 16	Sept. 20	Oct. 19	186
Peoria, Ill.	Apr. 13	Oct. 30	May 11	Apr. 15	Sept. 26	...do...	187
Springfield, Ill.	Apr. 14	Oct. 11	May 25	...do...	Sept. 25	...do...	187
Alpena, Mich.	May 2	...do...	June 9	May 13	Sept. 6	Oct. 1	141
Detroit, Mich.	Apr. 17	Oct. 14	May 31	Apr. 28	Sept. 21	Oct. 15	170
Grand Haven, Mich.	May 2	Nov. 3	May 28	Apr. 30	Sept. 23	Oct. 18	171
Grand Rapids, Mich.	Apr. 27	Nov. 2[1]	May 30	May 1	...do...	...do...	170
Ludington, Mich.	May 2[1]	Nov. 2	June 17	May 2	Sept. 4	Oct. 21	172
Marquette, Mich.	...do...	Oct. 6	June 6	May 13	Aug. 23	Oct. 9	149
Green Bay, Wis.	May 2	...do...	May 30	May 5	Sept. 16	...do...	157
La Crosse, Wis.	Apr. 27[1]	...do...	May 24	Apr. 29	Sept. 10	...do...	163
Madison, Wis.	Apr. 13	...do...	May 25	Apr. 26	Sept. 16	Oct. 17	174
Milwaukee, Wis.	Apr. 13[1]	...do...	May 29	...do...	Sept. 25	Oct. 18	175
Duluth, Minn.	May 4[1]	Oct. 9	June 14	May 6	Sept. 10	Oct. 5	152
Minneapllis, Minn.	Apr. 26	Oct. 13	May 20	Apr. 27	Sept. 13	Oct. 10	166
Moorhead, Minn.	May 1	Oct. 5	June 8	May 12	Aug. 25	Sept. 24	135
Charles City, Iowa	Apr. 27	Oct. 6	May 21	Apr. 29	Sept. 12	Oct. 2	156
Des Moines, Iowa	Apr. 14	Oct. 13	May 31	Apr. 21	Sept. 13	Oct. 9	171
Dubuque, Iowa	...do...	Oct. 6	May 21	Apr. 20	Sept. 26	Oct. 16	179
Keokuk, Iowa	Apr. 27[1]	Oct. 11	May 4	Apr. 12	Sept. 18	Oct. 17	188
Columbia, Mo.	Mar. 31[1]	Oct. 6	May 9	Apr. 13	...do...	Oct. 18	188
St. Joseph, Mo.	...do...	Oct. 11	Apr. 28	Apr. 9	Sept. 26	Oct. 17	191
St. Louis, Mo.	Mar. 15	Nov. 1	May 22	Apr. 3	Sept. 30	Oct. 29	209
Springfield, Mo.	Mar. 22	...do...	May 19	Apr. 12	...do...	Oct. 22	193
Bismarck, N. Dak.	Apr. 27	Sept. 22	June 7	May 11	Aug. 23	Sept. 21	133
Devils Lake, N. Dak.	May 1	Oct. 5	...do...	May 16	Aug. 8	Sept. 24	131
Williston, N. Dak.	May 16	Sept. 28	June 16	May 16	Aug. 22	Sept. 20	127
Huron, S. Dak.	Apr. 14	Sept. 29	June 21	May 9	Aug. 23	Sept. 25	139
Pierre, S. Dak.	Apr. 27[1]	Oct. 9	May 24	Apr. 30	Sept. 12	Oct. 7	160
Rapid City, S. Dak.	Apr. 26	Oct. 5	...do...	May 3	Sept. 13	Oct. 1	151
Yankton, S. Dak.	Apr. 14[1]	Oct. 21	May 27	May 1	Sept. 14	Oct. 6	156
North Platte, Nebr.	Apr. 26	Oct. 5	May 24	...do...	Sept. 10	Oct. 2	154
Omaha, Nebr.	Mar. 31	Oct. 26	May 19	Apr. 14	Sept. 18	Oct. 15	184
Valentine, Nebr.	May 1	Sept. 27	June 21	May 6	Sept. 12	Oct. 2	149
Concordia, Kans.	Mar. 23	Oct. 29	May 19	Apr. 17	Sept. 27	Oct. 16	182
Dodge City, Kans.	Apr. 11	Oct. 20	May 27	Apr. 16	Sept. 23	Oct. 21	188
Iola, Kans.	Mar. 23	Oct. 6	May 4	Apr. 7	Sept. 26	Oct. 17	193
Wichita, Kans.	Mar. 17	Oct. 11	May 15	Apr. 9	Sept. 23	Oct. 23	197
Washington, D. C.	Apr. 17	Nov. 13	May 12	Apr. 8	Oct. 2	Oct. 20	195
Lynchburg, Va.	Mar. 16[1]	Nov. 2	May 7	Apr. 9	...do...	Oct. 27	201
Norfolk, Va.	Mar. 14	Nov. 26[1]	Apr. 26	Mar. 25	Oct. 11	Nov. 16	236
Richmond, Va.	Mar. 11	Nov. 13	...do...	Mar. 31	Oct. 12	Nov. 2	216
Wytheville, Va.	Apr. 19	Oct. 29	May 27	Apr. 20	Sept. 19	Oct. 17	180
Elkins, W. Va.	May 3	...do...	June 1	May 4	Sept. 20	Oct. 12	161
Parkersburg, W. Va.	Apr. 18	Nov. 2	May 22	Apr. 17	Sept. 29	Oct. 18	184
Asheville, N. C.	Mar. 16	Oct. 7	May 10	Apr. 11	Oct. 3	Oct. 22	194
Charlotte, N. C.	Mar. 15	Nov. 13	Apr. 26	Mar. 25	Oct. 8	Nov. 5	225
Raleigh, N. C.	Mar. 16	...do...	Apr. 26	Mar 27	...do...	...do...	229
Wilmington, N. C.	Mar. 11	Nov. 14	May 1	Mar. 21	Oct. 16	Nov. 15	239
Charleston, S. C.	Mar. 10	None	Apr. 2	Feb. 28	Oct. 28	Dec. 1	276

[1] Temperature 32° F. or below.

TABLE 478.—*Frost: Dates of killing frosts, with length of growing season*—Con.

Station	Date of last killing frost in spring, 1932	Date of first killing frost in fall, 1932	Averages and extremes of killing frost for 30 to 51 years: Spring frosts: Latest date	Spring frosts: Average date	Fall frosts: Earliest date	Fall frosts: Average date of first	Length of growing season between average dates of killing frosts
							Days
Columbia, S. C.	Mar. 15	Nov. 13	Apr. 17	Mar. 17	Oct. 30	Nov. 18	246
Greenville, S. C.	do	do	Apr. 24	do	Oct. 10	Nov. 13	241
Atlanta, Ga.	do	Nov. 12	Apr. 17	Mar. 29	Oct. 11	Nov. 8	224
Augusta, Ga.	Mar. 11	Nov. 14	do	Mar. 15	Oct. 21	Nov. 12	242
Macon, Ga.	Mar. 14	do	Apr. 18	Mar. 14	Oct. 25	Nov. 14	245
Savannah, Ga.	Mar. 11	Nov. 13	Apr. 13	Feb. 26	do	Nov. 23	270
Thomasville, Ga.	Mar. 15	do	Apr. 26	Mar. 8	do	Nov. 20	257
Apalachicola, Fla.	Mar. 10[1]	None.	Mar. 23	Feb. 5	Nov. 13	Dec. 28	326
Avon Park, Fla.	Mar. 14		Mar. 14	Jan. 12	Nov. 14	Dec. 26	348
Jacksonville, Fla.	do	None.	Apr. 10	Feb. 16	Nov. 12	Dec. 7	294
Miami, Fla.	None.	do	Mar. 3	(2)	Nov. 21	(2)	(2)
Tampa, Fla.	do	do	Mar. 19	(2)	do	(2)	(2)
Chattanooga, Tenn.	Mar. 10	Nov. 13	May 14	Mar. 29	Sept. 30	Nov. 4	220
Knoxville, Tenn.	Mar. 23	Nov. 10	Apr. 26	Apr. 2	Oct. 1	Oct. 29	210
Memphis, Tenn.	Mar. 12	Nov. 12	Apr. 25	Mar. 21	Oct. 2	Nov. 4	228
Nashville, Tenn.	Mar. 23	do	Apr. 24	Mar. 31	Oct. 8	Oct. 28	211
Birmingham, Ala.	Mar. 10	Dec. 8	Apr. 20	Mar. 17	Oct. 21	Nov. 10	238
Mobile, Ala.	do	Dec. 18	Apr. 6	Feb. 17	Oct. 31	Dec. 7	293
Montgomery, Ala.	Mar. 15[1]	Nov. 13	Apr. 5	Mar. 8	Oct. 21	Nov. 13	250
New Orleans, La.	Mar. 14	Dec. 17[1]	Mar. 27	Jan. 25	Nov. 11	Dec. 18	327
Shreveport, La.	Mar. 13	Nov. 16	Apr. 9	Mar. 6	Oct. 20	Nov. 12	251
Abilene, Tex.	Mar. 22	Nov. 12	Apr. 23	Mar. 23	Oct. 19	Nov. 9	231
Amarillo, Tex.	Mar. 27	Oct. 29	May 23	Apr. 14	Oct. 16	Nov. 1	201
Brownsville, Tex.	Mar. 14	Dec. 17[1]	Mar. 14	Jan. 25	Nov. 15	Dec. 23	332
Corpus Christi, Tex.	do	do	Mar. 19	Feb. 15	Nov. 29	Dec. 20	308
Del Rio, Tex.	Mar. 14[1]	Nov. 12	Mar. 27	Feb. 23	Oct. 27	Nov. 27	277
El Paso, Tex.	Mar. 31	Oct. 26	Apr. 26	Mar. 19	Oct. 23	Nov. 16	242
Fort Worth, Tex.	Mar. 13	Nov. 12	Apr. 9	Mar. 10	Oct. 22	do	251
Galveston, Tex.	Mar. 13[1]	Dec. 16[1]	Mar. 19	Jan. 10	Nov. 10	Dec. 26	341
Palestine, Tex.	do	Nov. 16	Apr. 5	Mar. 13	Oct. 20	Nov. 13	245
San Antonio, Tex.	do	Nov. 12	do	Feb. 23	Oct. 30	Nov. 29	279
Taylor, Tex.	do	Nov. 16	do	Mar. 5	do	Nov. 26	266
Oklahoma City, Okla.	Mar. 22	Nov. 11	Apr. 30	Mar. 30	Oct. 7	Nov. 3	218
Fort Smith, Ark.	Mar. 14	do	Apr. 17	Mar. 23	Oct. 9	Nov. 6	228
Little Rock, Ark.	do	do	Apr. 26	Mar. 18	Oct. 22	Nov. 14	241
Havre, Mont.	May 1	Sept. 26	June 6	May 14	Aug. 25	Sept. 20	129
Helena, Mont.	Apr. 30[1]	Sept. 22	June 9	May 7	do	Sept. 29	145
Kalispell, Mont.	May 25[1]	Oct. 9	June 7	May 10	Sept. 6	Sept. 30	143
Miles City, Mont.	Apr. 26	Oct. 7	May 31	May 5	Sept. 7	Oct. 2	150
Cheyenne, Wyo.	May 16	Oct. 4	June 13	May 18	Aug. 25	Sept. 22	127
Lander, Wyo.	June 2	Aug. 31	June 20	do	Aug. 23	Sept. 18	123
Sheridan, Wyo.	May 27	Sept. 22	June 6	May 20	Aug. 25	Sept. 20	123
Yellowstone Park, Wyo.	June 7[1]	Sept. 21	June 22	May 21	do	Sept. 16	118
Denver, Colo.	Apr. 28[1]	Oct. 18	June 6	May 3	Sept. 12	Oct. 10	160
Grand Junction, Colo.	Mar. 31	Oct. 19	May 14	Apr. 16	Sept. 14	Oct. 19	186
Pueblo, Colo.	Apr. 28	Oct. 25	June 2	Apr. 24	Sept. 12	Oct. 10	169
Roswell, N. Mex.	Mar. 22	Oct. 26	May 7	Apr. 10	Oct. 10	Oct. 28	201
Santa Fe, N. Mex.	Apr. 28	Oct. 5	May 23	Apr. 25	Sept. 25	Oct. 19	177
Flagstaff, Ariz.	June 8	Oct. 6	June 17	May 31	Sept. 12	Sept. 24	116
Phoenix, Ariz.	Feb. 4[1]	Dec. 16	Mar. 31	Feb. 10	Nov. 5	Dec. 3	296
Tucson, Ariz.	Mar. 5[1]		Apr. 3	Mar. 11	Oct. 22	Nov. 9	243
Yuma, Ariz.	Jan. 29	Dec. 13[1]	Mar. 15	Jan. 20	Nov. 19	Dec. 20	334
Modena, Utah	June 7	Oct. 11	July 3	May 21	Sept. 5	Sept. 29	131
Salt Lake City, Utah	Apr. 20[1]	Oct. 20[1]	June 18	Apr. 18	Sept. 22	Oct. 20	185
Reno, Nev.	Apr. 22[1]	Oct. 18	June 13	May 14	Sept. 6	Oct. 6	145
Winnemucca, Nev.	Apr. 26[1]	Oct. 10	June 22	do	Aug. 22	Sept. 27	136
Boise, Idaho	Apr. 6	Oct. 19	June 16	Apr. 27	Sept. 11	Oct. 12	168
Lewiston, Idaho	Mar. 12[1]	do	May 10	Apr. 6	Sept. 21	Oct. 24	201
Pocatello, Idaho	Apr. 9	Oct. 4	June 1	Apr. 29	Sept. 8	Oct. 6	160
Seattle, Wash.	Mar. 3	Dec. 7	May 10	Mar. 16	Oct. 18	Nov. 22	251
Spokane, Wash.	Mar. 26[1]	Oct. 24	June 8	Apr. 14	Sept. 7	Oct. 13	182
Walla Walla, Wash.	Mar. 12	Nov. 10	May 9	Mar. 31	Sept. 24	Nov. 4	218
Baker, Oreg.	May 27	Sept. 21	June 23	May 17	Aug. 30	Sept. 29	135
Portland, Oreg.	Mar. 3	Dec. 7	May 2	Mar. 15	Oct. 13	Nov. 21	251
Roseburg, Oreg.	do	Dec. 8	May 24	Apr. 8	Sept. 24	Nov. 11	217
Eureka, Calif.	do.[1]	Dec. 10	Apr. 7	Mar. 16	Nov. 11	Dec. 18	277
Fresno, Calif.	Feb. 3	Dec. 12	Apr. 14	Feb. 22	Oct. 31	Nov. 30	281
Independence, Calif.	Apr. 27[1]	Nov. 4[1]	May 24	Apr. 13	Sept. 24	Oct. 27	197
Los Angeles, Calif.	Jan. 14	None.	Feb. 17	(2)	Nov. 2	(2)	(2)
Red Bluff, Calif.	Feb. 19[1]	Dec. 8	May 9	May 8	Nov. 5	Dec. 5	272
Sacramento, Calif.	Feb. 2[1]	Dec. 9	May 7	Feb. 19	Nov. 11	Nov. 29	283
San Bernardino, Calif.	Apr. 23[1]		Apr. 23	Mar. 8	Oct. 23	Nov. 22	259
San Diego, Calif.	None.	None.	Jan. 20	(2)	Dec. 26	(2)	(2)
San Francisco, Calif.	do	Dec. 11	Mar. 26	Jan. 13	Dec. 4	Dec. 29	350

Weather Bureau.

[1] Temperature 32° F. or below.

(2) Frosts do not occur every year.

TABLE 479.—*Monthly and annual rainfall by States, 1931*

State	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
	Ins.	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Alabama	3.10	3.41	3.80	3.42	3.35	1.49	5.74	4.66	1.23	1.73	1.76	8.90	42.59
Arizona	.47	3.75	.23	1.09	.29	.70	2.28	4.06	1.64	.64	2.57	1.58	19.30
Arkansas	1.14	4.77	4.21	2.62	3.45	2.60	6.00	4.71	1.00	2.35	6.34	7.79	46.98
California	4.14	2.56	1.47	1.28	1.03	.77	.04	.24	.18	1.26	2.92	8.48	24.37
Colorado	.17	1.26	1.17	1.26	1.69	1.25	1.42	1.37	1.46	1.00	1.40	.58	14.03
Florida	*3.38*	*2.11*	*5.23*	*4.46*	*3.35*	*2.12*	*5.88*	*6.27*	*5.32*	*2.41*	*.48*	*2.96*	*43.97*
Georgia	2.91	2.83	2.96	3.01	3.45	1.80	4.75	5.04	1.31	1.04	.63	7.02	36.75
Idaho	1.41	1.09	2.40	.95	.66	.63	.30	.20	.98	1.43	1.88	2.71	14.64
Illinois	.57	1.29	2.75	2.68	4.25	3.17	2.92	3.95	4.77	3.71	4.87	2.95	37.88
Indiana	.80	1.65	3.03	3.13	2.96	3.61	3.08	4.38	4.75	3.72	3.86	3.40	38.37
Iowa	.50	.25	1.68	2.29	2.96	3.73	2.72	3.30	6.69	3.01	5.76	2.48	35.37
Kansas	.26	.08	2.41	2.41	2.89	2.15	2.32	3.27	2.50	1.60	4.46	.65	25.90
Kentucky	*1.23*	*3.20*	*3.68*	*4.52*	*2.59*	*2.79*	*3.85*	*5.36*	*2.74*	*3.01*	*3.52*	*5.51*	*42.00*
Louisiana	5.83	3.73	4.15	2.25	3.24	2.02	6.22	4.91	1.88	3.31	4.84	10.53	52.91
Maryland and Delaware	1.72	1.66	4.38	3.08	4.50	3.43	4.53	7.70	2.54	1.78	.94	2.45	38.71
Michigan	1.26	.79	2.05	1.49	3.21	3.40	1.77	1.86	5.06	3.07	3.85	2.01	29.82
Minnesota	.17	.40	1.23	.86	2.29	3.95	2.31	2.83	2.55	2.48	2.88	.58	22.53
Mississippi	3.54	3.65	4.63	2.41	3.99	2.32	8.91	3.74	.78	1.82	4.64	11.96	52.39
Missouri	*.69*	*2.40*	*3.02*	*3.07*	*4.55*	*2.94*	*3.23*	*4.77*	*4.16*	*3.45*	*5.46*	*2.57*	*40.31*
Montana	.35	.36	.80	.56	.92	1.34	1.67	.48	1.66	.42	.91	.62	10.09
Nebraska	.22	.64	1.74	1.38	2.23	2.43	1.92	2.27	2.28	1.19	2.21	1.14	19.65
Nevada	.47	.73	.48	.72	.38	.48	.14	.86	.53	.39	.98	1.85	8.01
New Jersey	2.16	2.18	4.14	2.85	3.73	4.84	4.24	5.10	1.98	2.76	.82	2.27	37.07
New Mexico	.45	1.49	.99	2.30	1.07	.76	2.56	3.07	2.50	.97	1.26	.90	18.32
New York	2.42	1.80	2.27	3.32	4.77	3.45	5.39	3.05	3.86	2.44	2.25	3.06	38.08
North Carolina	2.21	1.83	3.66	4.28	4.88	2.55	6.07	7.52	1.71	1.11	.84	6.91	43.57
North Dakota	.15	.28	.94	.43	1.41	2.35	3.03	2.09	2.14	1.30	.55	.23	14.99
Ohio	1.23	1.85	2.14	4.31	3.07	3.58	3.77	4.99	4.01	2.42	2.70	3.52	37.59
Oklahoma	.64	2.44	3.08	3.06	2.01	2.01	2.99	2.79	1.17	4.33	4.94	1.23	31.59
Oregon	2.63	1.71	4.06	1.50	.66	2.31	.01	.02	.99	2.49	3.53	4.61	24.52
Pennsylvania	1.46	1.98	2.96	3.33	5.28	3.71	5.28	4.01	3.15	1.83	1.52	2.85	37.36
South Carolina	2.58	1.77	2.98	3.24	4.74	2.21	5.35	4.84	.98	.80	.54	7.14	37.17
South Dakota	.23	.32	1.16	.78	2.02	2.37	1.46	1.61	1.42	1.32	.98	1.06	14.73
Tennessee	1.83	4.08	3.79	3.62	2.84	1.86	4.82	4.67	1.51	1.88	3.52	8.78	43.20
Texas	2.81	2.96	2.50	2.36	2.40	2.01	3.08	2.04	.68	2.26	2.20	3.96	29.26
Utah	.39	.71	.82	1.00	.87	.25	.79	.75	.53	.82	1.54	1.59	10.06
Virginia	1.58	1.89	3.56	3.55	5.15	3.23	5.35	6.68	2.46	1.10	.64	2.95	38.14
Washington	6.68	3.23	5.96	2.42	1.12	3.66	.16	.10	2.85	3.64	5.00	7.29	42.17
West Virginia	1.37	2.57	3.52	4.12	5.09	3.24	4.78	6.38	3.91	1.66	1.81	3.94	42.39
Wisconsin	.69	.61	1.73	1.22	1.86	4.55	2.09	2.74	5.82	3.03	4.17	1.17	29.68
Wyoming	.24	.48	1.04	1.14	1.79	1.04	1.32	.93	1.06	1.31	.69	.53	11.57
New England	2.85	2.14	3.78	2.90	4.31	5.45	4.24	4.12	3.26	3.29	1.33	3.35	41.02

Weather Bureau.

TABLE 480.—*Saw-timber area, stand, growth, and depletion in the United States*

Region	Area	Stand [1]	Annual growth [2]	Annual depletion			
				Cut [3]	Destroyed by fire [4]	Other destruction [5]	Total
	Thousand acres	*Million ft. b. m.*	*Million ft. b. m.*	*Million ft. b. m.*	*Million ft. b. m.*	*Million ft. b. m.*	*Million ft. b. m.*
New England	13,860	57,875	791	1,648	2	255	1,905
Middle Atlantic [6]	7,294	26,150	606	1,061	7	14	1,082
Lake	5,095	35,887	126	2,709	4	35	2,748
Central [7]	21,224	34,622	862	5,454	12	59	5,525
South [8]	57,265	199,297	5,352	25,233	395	411	26,039
Eastern regions	104,738	353,831	7,736	36,105	420	774	37,299
Pacific coast	44,140	1,041,628	1,196	16,487	564	1,749	18,800
North Rocky Mountain [9]	17,026	146,388	444	1,510	393	474	2,377
South Rocky Mountain [10]	22,741	125,956	367	540	13	105	658
Western regions	83,907	1,313,972	2,007	18,537	970	2,328	21,835
Total, all regions	188,645	1,667,803	9,743	54,642	1,390	3,102	59,134

Forest Service.

[1] Standing timber of all species of size suitable for lumber according to the local practice in each region, as of 1930.
[2] Current annual growth of timber of saw-timber size.
[3] Cut for lumber and other commodities, averaged for the period 1925–1929.
[4] Saw timber destroyed, averaged for the period 1925–1929.
[5] Destruction due to insects, disease, windfall, etc., averaged for the period 1919–1929.
[6] Includes New York, Pennsylvania, New Jersey, Delaware, and Maryland.
[7] Includes Ohio, Indiana, Illinois, Iowa, Kansas, Missouri, Nebraska, Tennessee, Kentucky, and West Virginia.
[8] Includes the coastwise States, Virginia to Texas, inclusive; also Arkansas and Oklahoma.
[9] Includes Idaho and Montana.
[10] Includes the other Rocky Mountain States and South Dakota (Black Hills).

TABLE 481.—*Production of lumber, by States, 1929–1931*

State	1929	1930	1931	State	1929	1930	1931
	M ft. b. m.	*M ft. b. m.*	*M ft. b. m.*		*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*
Alabama	2,058,964	1,341,624	732,020	New Mexico	148,287	142,885	68,787
Arizona	174,504	95,497	85,085	New York	159,591	109,617	74,052
Arkansas	1,348,318	869,379	507,715	North Carolina	1,202,377	814,835	500,802
California [1]	[1] 2,063,229	[1] 1,514,263	957,740	Ohio	175,537	108,198	52,707
Colorado	71,535	54,688	48,413	Oklahoma	100,744	163,477	76,978
Connecticut	30,157	20,525	12,891	Oregon	4,784,000	3,654,075	2,628,035
Delaware	9,641	8,436	3,529	Pennsylvania	314,250	208,762	123,027
Florida	1,136,897	876,039	576,626	Rhode Island	6,514	7,019	2,950
Georgia	1,386,250	753,484	459,617	South Carolina	1,067,987	707,415	450,367
Idaho	1,028,791	840,409	409,899	South Dakota	61,126	59,464	26,840
Illinois	37,681	25,212	18,446	Tennessee	763,828	413,937	203,452
Indiana	169,970	97,837	52,823	Texas	1,451,640	1,045,262	555,814
Kentucky	339,146	189,455	111,354	Utah	5,301	6,489	5,794
Louisiana	2,232,360	1,606,718	949,232	Vermont	119,622	94,217	60,609
Maine	257,910	222,104	151,830	Virginia	708,452	495,489	311,370
Maryland	54,870	47,666	20,088	Washington	7,302,063	5,602,129	3,907,997
Massachusetts	71,863	82,101	42,807	West Virginia	632,902	408,083	246,901
Michigan	571,017	486,831	256,663	Wisconsin	842,814	636,844	360,041
Minnesota	357,180	222,389	94,968	Wyoming	25,629	25,132	16,629
Mississippi	2,669,496	1,484,378	863,221	All other	[2] 20,332	[2] 13,349	[2] 10,509
Missouri	228,078	126,735	74,916				
Montana	388,711	296,990	158,213				
New Hampshire	191,703	181,702	94,455	Total, United States	[3] 36,886,032	[3] 26,051,473	[3] 16,522,643
New Jersey	15,576	12,333	7,341				

Forest service in cooperation with the Bureau of the Census.

[1] Includes cut of Nevada.
[2] Includes cut of Iowa, Kansas, and Nebraska.
[3] Mills cutting less than 50,000 feet each year excluded.

TABLE 482.—*Average value of lumber at the mill per thousand feet board measure, in stated years*

Kind of wood	1899	1909	1919	1927	1929	1930	1931
Softwoods:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Balsam fir	(1)	13.99	32.23	25.92	25.40	26.72	19.34
Cedar	10.91	19.95	33.80	34.39	34.83	31.14	24.08
Cypress	13.32	20.46	38.38	39.91	35.29	33.10	30.14
Douglas fir	8.67	12.44	24.62	19.45	20.05	16.91	12.05
Hemlock	9.98	13.95	29.16	19.06	18.90	17.04	14.13
Larch (tamarack)	8.73	12.68	23.39	17.69	18.35	17.18	14.18
Lodgepole pine	(1)	16.25	29.98	20.82	17.97	17.64	14.46
Redwood	10.12	14.80	30.04	33.81	31.00	30.33	29.82
Spruce	11.27	16.91	30.76	26.59	28.64	23.66	23.00
Sugar pine	12.30	18.14	35.99	43.22	43.06	38.10	28.76
Ponderosa pine	9.70	15.39	27.75	26.04	26.47	23.52	20.48
White fir	(1)	13.10	25.66	19.02	20.63	17.57	14.94
White pine	12.69	18.16	32.83	29.90	29.87	27.81	24.71
Yellow pine	8.46	12.69	28.71	23.77	25.66	21.06	16.99
Hardwoods:							
Ash	15.64	24.44	52.69	43.82	43.14	39.72	41.06
Basswood	12.84	19.50	40.03	89.84	39.88	35.51	28.54
Beech	(1)	13.25	29.98	27.21	28.39	25.89	22.93
Birch	12.50	16.95	35.79	41.03	39.35	36.39	30.95
Chestnut	13.37	16.12	32.30	29.35	29.51	22.91	22.59
Cottonwood	10.37	18.05	32.24	30.92	29.70	22.73	19.54
Elm	11.47	17.52	36.39	38.22	35.28	30.20	25.37
Gum, red and sap	9.63	13.20	32.68	32.61	34.42	27.67	22.68
Hickory	18.78	30.80	44.37	37.08	40.33	33.00	32.65
Maple	11.83	15.77	35.56	35.35	38.93	34.54	28.80
Oak	13.78	20.50	37.87	35.72	38.43	29.29	27.68
Sycamore	11.04	14.87	30.32	29.31	30.07	28.54	22.40
Tupelo	(1)	11.87	28.42	24.45	25.39	23.47	19.05
Walnut	36.49	43.79	72.13	111.64	119.15	100.75	90.44
Yellow poplar	14.03	25.39	41.65	38.58	40.66	35.19	30.02
All kinds	11.13	15.38	30.21	25.80	26.94	22.61	18.56

Bureau of the Census in cooperation with the Forest Service.

[1] No data available.

TABLE 483.—*Fires on national forests, 1924–1931*

Year	Fires	Area burned [1]	Damage		Cost of fighting fire [3]
			Timber destroyed	Value all items [2]	
	Number	*Thousand acres*	*M ft. b. m.*	*Dollars*	*Dollars*
1924	8,247	826	677,925	1,892,605	1,715,706
1925	8,263	349	342,554	968,892	947,773
1926	7,095	956	1,329,573	5,716,660	2,298,358
1927	5,693	224	84,396	375,338	710,212
1928	6,921	499	234,460	1,395,018	1,309,872
1929	7,449	978	1,427,551	5,831,838	3,400,403
1930	8,388	206	65,951	493,229	1,303,099
1931	8,466	640	989,631	4,409,309	4,271,294

Forest Service.

[1] Government and private land inside national-forest boundaries.
[2] Includes the reported value of timber destroyed, forage, and buildings.
[3] Includes the cost of emergency patrol, tools, and supplies.

TABLE 484.—*Estimated lumber production, exports, imports, and consumption, specified years*

Year	Estimated production			Exports [1]	Imports [1]	Visible consumption [2]	Per capita consumption (rounded)
	Softwood	Hardwood	Total				
	M ft. b. m.	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*Ft. b. m.*
1809			400,000			400,000	55
1819			550,000			550,000	55
1829			850,000			850,000	65
1839			1,604,000			1,604,000	95
1849			5,392,000			5,392,000	235
1859			8,029,000			8,029,000	260
1869			12,755,543	134,370	332,692	12,953,865	340
1879			18,091,356	275,102	355,304	18,171,558	365
1889			27,038,757	571,075	648,174	27,115,856	435
1899	26,371,336	8,706,259	35,077,595	1,004,464	423,928	34,497,059	460
1904	32,538,000	10,462,000	43,000,000	2,156,581	746,556	41,589,975	505
1905	32,960,000	10,540,000	43,500,000	2,012,049	938,001	42,425,952	505
1906	34,900,000	11,100,000	46,000,000	2,317,477	1,178,701	44,861,224	525
1907	34,946,000	11,054,000	46,000,000	2,501,486	1,056,965	44,555,479	510
1908	31,945,000	10,055,000	42,000,000	2,064,748	894,877	40,830,129	460
1909	33,896,959	10,612,802	44,509,761	2,293,242	1,083,018	43,299,537	475
1910	34,029,000	10,471,000	44,500,000	2,652,197	1,117,504	42,965,307	465
1911	33,020,000	9,980,000	43,000,000	3,009,434	925,488	40,916,054	435
1912	34,695,000	10,305,000	45,000,000	3,038,173	1,084,720	43,046,547	455
1913	34,065,000	9,935,000	44,000,000	3,293,037	1,031,016	41,719,979	430
1914	31,481,000	9,019,000	40,500,000	2,294,475	949,136	39,154,661	400
1915	29,655,000	8,345,000	38,000,000	1,526,618	1,096,287	37,569,669	380
1916	31,344,000	8,656,000	40,000,000	1,571,545	1,265,561	39,694,016	395
1917	28,325,000	7,675,000	36,000,000	1,346,519	1,234,447	35,887,928	350
1918	25,277,000	6,723,000	32,000,000	1,233,706	1,246,712	32,013,006	310
1919	27,407,130	7,144,946	34,552,076	1,677,843	1,190,845	34,065,078	325
1920	27,610,000	7,390,000	35,000,000	1,916,166	1,416,175	34,500,009	325
1921	23,444,000	5,556,000	29,000,000	1,511,396	902,216	28,390,820	260
1922	28,922,000	6,328,000	35,250,000	1,960,639	1,563,211	34,852,572	315
1923	33,220,000	7,780,000	41,000,000	2,472,352	1,993,327	39,722,975	355
1924	31,549,000	7,951,000	39,500,000	2,712,501	1,766,068	38,800,562	345
1925	33,284,000	7,716,000	41,000,000	2,648,023	1,875,101	39,453,078	345
1926	32,[illegible],000	7,672,000	39,750,000	2,870,145	1,932,862	39,203,717	335
1927	29,975,000	7,275,000	37,250,000	3,181,590	1,781,116	35,424,526	300
1928	29,852,000	6,898,000	36,750,000	3,382,281	1,493,448	36,579,167	305
1929	29,813,345	7,072,687	36,886,032	3,364,470	1,570,082	33,680,644	275
1930	21,363,000	4,737,000	26,100,000	2,410,210	1,240,120	25,686,968	210
1931	13,875,000	2,675,000	16,550,000	1,770,058	758,454	16,197,088	130

Forest Service.

[1] Sawed products, compiled principally from foreign commerce and navigation of the United States, U. S. Department of Commerce.
[2] Beginning with 1923 these figures include allowance for the reported net change in mill stocks.

TABLE 485.—*Pulpwood consumption, wood-pulp and paper production by States, 1928–1931*

State	Pulpwood consumption				Wood-pulp production				Paper production			
	1928	1929	1930	1931	1928	1929	1930	1931	1928	1929	1930	1931
	1,000 cords	*1,000 cords*	*1,000 cords*	*1,000 cords*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
California	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	184	254	231	192
Louisiana	414	460	423	431	227	247	244	261	238	274	278	295
Maine	1,310	1,312	1,203	1,112	971	981	905	880	987	1,061	1,029	956
Massachusetts	51	45	43	33	32	29	29	24	541	562	491	406
Michigan	332	313	280	251	196	178	193	150	1,061	1,092	991	903
Minnesota	283	266	230	198	194	190	182	148	274	318	279	241
New Hampshire	351	376	243	151	199	213	138	90	200	196	158	130
New York	802	826	763	583	633	663	596	467	1,454	1,513	1,348	1,160
North Carolina	(2)	(2)	(2)	264	(2)	(2)	(2)	123	63	70	65	61
Ohio	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	895	937	860	789
Oregon	[3] 308	[3] 341	[3] 351	320	[3] 213	[3] 257	[3] 249	[3] 238	198	223	129	200
Pennsylvania	405	398	353	293	219	213	189	160	713	749	666	608
Tennessee	(2)	(2)	75	95	(2)	(2)	53	68	49	84	97	95
Vermont	20	25	24	25	20	26	25	26	72	73	69	66
Virginia	343	375	378	368	190	206	216	223	219	242	262	275
Washington	652	956	1,000	1,026	349	524	566	580	309	382	395	375
West Virginia	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	43	52	35	44
Wisconsin	1,226	1,234	1,169	957	721	734	701	586	893	886	835	727
All other States	663	718	661	616	347	402	344	376	2,010	2,172	1,951	1,859
Total	7,160	7,645	7,196	6,723	4,511	4,863	4,630	4,409	10,403	11,140	10,169	9,382

Bureau of the Census in cooperation with the Forest Service.

[1] Included with Oregon.
[2] Included in "All other States."
[3] Includes California.

TABLE 486.—*Pulpwood consumption, wood-pulp and paper production of the United States, 1899 and 1904–1931*

Year	Pulpwood consumption	Wood-pulp production	Paper production	Year	Pulpwood consumption	Wood-pulp production	Paper production
	Cords	*Short tons*	*Short tons*		*Cords*	*Short tons*	*Short tons*
1899	1,986,310	1,179,525	2,167,593	1919	5,477,832	3,517,952	6,190,361
1904		1,921,768	3,106,696	1920	6,114,072	3,821,704	7,334,614
1905	3,192,123			1921	4,557,179	2,875,601	5,356,317
1906	3,661,176			1922	5,548,842	3,521,644	7,017,800
1907	3,962,660	2,547,879		1923	5,872,870	3,788,672	8,029,482
1908	3,346,953	2,118,947		1924	5,768,082	3,723,266	
1909	4,001,607	2,495,523	4,216,708	1925	6,093,821	3,962,217	9,182,204
1910	4,094,306	2,533,976		1926	6,766,007	4,394,766	
1911	4,328,052	2,686,134		1927	6,750,935	4,313,403	10,002,070
1914	4,470,763	2,893,150	5,270,047	1928	7,160,100	4,510,800	10,403,338
1916	5,228,558	3,435,001		1929	7,645,011	4,862,685	11,140,235
1917	5,480,075	3,509,939	5,919,647	1930	7,195,524	4,630,308	10,169,140
1918	5,250,794	3,313,861	6,051,523	1931	6,722,766	4,409,344	9,381,840

Bureau of the Census in cooperation with the Forest Service and Federal Trade Commission.

TABLE 487.—*Pulpwood consumption, by kinds, 1909, 1919, 1929–1931*

Kind of wood	1909	1919	1929	1930	1931 [1]
	Cords	*Cords*	*Cords*	*Cords*	*Cords*
Spruce:					
Domestic	1,653,249	2,313,419	2,074,267	1,844,937	1,651,051
Imported	768,332	873,795	1,029,913	888,255	676,339
Hemlock:					
Domestic	559,657	795,154	1,309,170	[2] 1,222,961	[2] 1,191,048
Imported			15,379		
Pine:					
Southern yellow pine	(3)	234,463	1,036,272	1,030,273	1,294,503
Jack pine	(3)	51,581	[2] 205,760	200,970	[2] 159,273
Miscellaneous pines	90,885	7,566			
Poplar:					
Domestic	302,876	180,160	329,466	291,897	266,603
Imported	25,622	158,220	157,829	159,092	94,238
Balsam fir:					
Domestic	95,366	181,840	317,552	330,548	338,790
Imported		106,974	45,412	48,935	55,601
Yellow poplar		72,605	129,697	107,795	73,504
White fir	37,176	31,138	111,054	90,652	109,277
Beech, birch, and maple	31,390	[4] 183,426	76,950	68,848	69,681
Gum		30,355	39,685	41,825	22,440
Tamarack (larch)		44,042	51,835	40,054	35,433
Other woods	188,077	38,013	153,485	232,980	126,942
Slabs and mill waste	248,977	175,081	501,285	595,502	558,043
Total	4,001,607	5,477,832	7,645,011	7,195,524	6,722,766

Bureau of the Census in cooperation with the Forest Service.

[1] Preliminary.
[2] Includes a small quantity of imported wood.
[3] Included in "Miscellaneous pines."
[4] Includes chestnut.

TABLE 488.—*Paper: Consumption by kinds, and apparent per capita, specified years, beginning 1810* [1]

Year	Newsprint	Book	Boards	Wrapping	Fine	All other	All kinds	Apparent per capita
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Pounds*
1810							[2] 3	1
1819							[2] 12	2
1839							[2] 38	4
1849							[2] 78	7
1859							[2] 127	8
1869							391	20
1879							457	18
1889							1,121	36
1899	569	314	394	535	113	233	2,158	57
1904	883	495	521	644	142	365	3,050	74
1909	1,159	689	883	763	193	537	4,224	93
1914	1,576	926	1,292	892	244	566	5,496	112
1917	1,824	846	1,805	814	276	691	6,256	122
1918	1,760	800	1,927	859	348	693	6,387	123
1919	1,892	838	1,940	825	306	692	6,493	124
1920	2,196	1,060	2,301	1,003	371	930	7,861	148
1921	2,002	707	1,641	770	230	704	6,054	112
1922	2,451	968	2,154	1,059	356	1,015	8,003	146
1923	2,814	1,235	2,802	1,177	374	938	9,340	167
1925	3,073	1,365	3,290	1,287	472	1,013	10,590	184
1926	3,517	1,408	3,637	1,435	495	1,315	11,807	203
1927	3,492	1,265	3,737	1,515	502	1,404	11,915	202
1928	3,561	1,321	4,009	1,457	538	1,562	12,448	208
1929	3,813	1,471	4,398	1,586	593	1,490	13,351	220
1930	3,496	1,370	4,014	1,556	564	1,251	12,251	199
1931	3,261	1,195	3,795	1,383	480	1,116	11,230	181

Forest Service. A computed table based on Bureau of the Census and Forest Service bulletins.

[1] Imports added to United States production and domestic exports deducted.
[2] Domestic production only, value of exports and imports being approximately equal.

Table 489.—*Stock grazed on the national forests, and receipts, 1905–1932*

Fiscal year	Cattle	Horses	Swine	Sheep	Goats	Receipts for grazing by fiscal years
	Number	*Number*	*Number*	*Number*	*Number*	*Dollars*
1905	632, 793	59, 331		1, 709, 987		(1)
1906	1, 015, 148	(2)		5, 762, 200	(3)	513, 000
1907	1, 200, 158	(2)		6, 657, 083	(3)	857, 005
1908	1, 304, 142	76, 003	2, 076	6, 960, 919	126, 192	947, 365
1909	1, 491, 385	90, 019	4, 501	7, 679, 698	139, 896	[4] 1, 022, 516
1910	1, 409, 873	84, 552	3, 145	7, 558, 650	90, 300	969, 971
1911	1, 351, 022	91, 516	4, 500	7, 371, 747	77, 668	927, 067
1912	1, 403, 025	95, 343	4, 330	7, 467, 890	83, 849	[4] 961, 489
1913	1, 455, 922	97, 919	3, 277	7, 790, 953	76, 898	999, 309
1914	1, 517, 045	99, 835	3, 381	7, 560, 186	58, 616	1, 002, 348
1915	1, 627, 321	96, 933	2, 792	7, 232, 276	51, 409	1, 130, 495
1916	1, 758, 764	98, 903	2, 968	7, 843, 205	43, 208	1, 210, 215
1917	1, 953, 198	98, 880	2, 306	7, 586, 034	49, 039	1, 549, 795
1918	2, 137, 854	102, 156	3, 371	8, 454, 240	57, 968	1, 725, 822
1919	2, 135, 527	93, 251	5, 154	7, 935, 174	60, 789	2, 609, 170
1920	2, 033, 800	83, 015	4, 066	7, 271, 136	53, 685	2, 460, 040
1920 [5]	88, 599	6, 444	1, 010	553, 263	3, 340	
1921 [6]	1, 999, 680	78, 115	2, 453	6, 936, 377	43, 574	2, 132, 075
1922 [6]	1, 882, 491	67, 856	2, 149	6, 497, 912	36, 153	1, 315, 975
1923 [6]	1, 804, 274	64, 104	1, 347	6, 377, 759	31, 379	2, 341, 486
1924 [6]	1, 664, 087	58, 184	1, 560	3, 301, 308	29, 068	1, 915, 561
1925 [6]	1, 538, 942	57, 904	846	6, 162, 263	19, 795	1, 725, 377
1926 [6]	1, 456, 858	57, 396	1, 085	6, 212, 657	15, 666	1, 421, 589
1927 [6]	1, 403, 192	55, 629	997	6, 376, 838	18, 046	1, 630, 952
1928 [6]	1, 335, 903	51, 956	1, 206	6, 497, 081	17, 070	1, 713, 780
1929 [6]	1, 322, 465	48, 171	853	6, 650, 719	15, 487	1, 740, 290
1930 [6]	1, 321, 431	42, 357	540	6, 799, 236	13, 496	1, 942, 914
1931 [6]	1, 338, 373	37, 335	431	6, 593, 583	14, 645	1, 960, 642
1932						829, 960

Forest Service.

[1] No data available.
[2] Included with cattle.
[3] Included with sheep.
[4] Subject to revision.
[5] Last 6 months only.
[6] Calendar year.

Table 490.—*Number of stock grazed in national forests, by States, calendar year 1931, and total grazing receipts, fiscal year 1932*

State	*Cattle*	*Horses*	*Swine*	*Sheep*	*Goats*	Receipts from grazing [1]
	Number	*Number*	*Number*	*Number*	*Number*	*Dollars*
Alabama	15					15
Arizona	185, 538	1, 465	204	390, 033	3, 345	80, 296
Arkansas	1, 378	11			10	621
California	142, 032	4, 380	125	397, 837	1, 327	72, 012
Colorado	280, 446	2, 777		1, 036, 853	33	156, 658
Florida	2, 223			899		909
Idaho	113, 856	6, 199		1, 324, 718		107, 348
Montana	126, 200	6, 223		613, 291	87	57, 365
Nebraska	11, 192	442				4, 277
Nevada	50, 305	2, 117		335, 238		40, 094
New Hampshire	190	4				148
New Mexico	86, 197	2, 651	102	217, 044	9, 592	49, 822
North Carolina	330	1		38		166
Oklahoma	2, 397					834
Oregon	81, 170	2, 009		655, 014	50	69, 960
Pennsylvania	57					40
South Dakota	28, 416	986		34, 193		5, 447
Tennessee	312			105		85
Utah	108, 249	3, 678		774, 720	201	82, 041
Virginia	1, 035	10		558		396
Washington	12, 334	409		150, 494		7, 929
West Virginia	420	15		731		327
Wyoming	104, 083	3, 958		661, 817		93, 576
Total	1, 338, 373	37, 335	431	6, 593, 583	14, 645	[2] 829, 960

Forest Service.

[1] Includes grazing trespass.
[2] Includes Georgia, $60; Maine, $10; South Carolina, $15.

Table 491.—*Free-use timber, cut from national forests, by States, 1928–1931*

State	Calendar year 1928		Calendar year 1929		Calendar year 1930		Calendar year 1931	
	Total quantity	Estimated users	Total quantity	Estimated users	Total quantity	Estimated users	Total quantity	Estimated users
	M ft.b.m.	*Number*	*M ft.b.m.*	*Number*	*M ft.b.m.*	*Number*	*M ft.b.m.*	*Number*
Alaska	2,006	508	533	502	510	503	74	7
Arizona	6,642	4,448	7,574	5,929	8,921	4,637	10,879	7,495
Arkansas	23	3	25	17	132	46	331	95
California	2,805	2,472	3,905	2,596	3,949	3,203	5,674	8,548
Colorado	9,728	4,241	7,436	2,674	9,326	3,120	10,894	4,138
Florida							45	55
Idaho	16,169	4,700	14,936	4,797	22,631	7,289	30,975	14,743
Michigan	70	19	475	61	918	131	981	254
Minnesota	137	10	167	56	183	40	219	110
Montana	7,852	3,826	10,426	6,144	16,800	11,961	17,375	9,281
Nebraska							53	32
Nevada	1,744	439	1,735	419	1,793	418	1,757	470
New Mexico	7,643	6,163	10,614	7,246	15,818	7,797	22,503	14,473
North Carolina	746	313	778	406	709	371	1,554	675
Oklahoma	55	60	60	65	65	70	118	114
Oregon	6,949	1,260	6,360	1,382	8,882	1,864	22,677	2,949
Pennsylvania	7	3	25	5	350	84	2,000	500
South Dakota	1,234	434	1,751	523	1,755	509	3,565	1,352
Tennessee	985	435	656	407	607	325	1,706	895
Utah	9,637	7,108	11,389	6,788	13,293	9,239	22,620	12,560
Virginia	427	225	316	187	491	287	436	306
Washington	751	195	727	237	1,142	316	2,741	721
West Virginia	13	5	31	10			81	33
Wisconsin							61	12
Wyoming	6,819	1,298	6,849	1,684	7,821	1,720	8,361	1,800
Total	82,442	38,165	86,768	42,135	116,096	53,930	167,680	81,618

Forest Service.

Table 492.—*Turpentine and rosin; industrial consumption, average, 1925–1929, annual 1930 and 1931*

Industry	Turpentine			Rosin		
	Average 1925–1929	1930	1931	Average 1925–1929	1930	1931
	Gallons	*Gallons*	*Gallons*	*500-pound barrels*	*500-pound barrels*	*500-pound barrels*
Automobiles and wagons	211,779	80,953	87,072	1,261	3,523	591
Chemicals and pharmaceuticals	49,203	70,185	41,259	5,138	5,246	3,938
Foundries and foundry supplies	17,005	27,144	6,305	21,323	17,399	7,193
Linoleum	3,066	2,754	2,703	44,541	29,458	21,746
Matches	95			2,965	2,953	2,453
Miscellaneous	42,573	65,556	40,917	3,427	3,752	2,362
Oils and greases	98,082	21,776	54,224	54,203	49,828	29,565
Paper and paper size	5,374	1,771	2,349	331,671	341,327	299,934
Paint and varnish	4,754,403	4,089,743	3,444,882	241,102	192,878	155,592
Printing ink	12,575	11,209	14,562	14,599	13,104	15,164
Sealing wax, pitch, insulations, and plastics	66,022	70,236	42,353	42,433	28,291	13,902
Shipyards, car shops	30,364	65,520	46,258	233	3,086	74
Shoe polish	617,449	527,838	555,046	735	610	587
Soap	3,280	10,539	5,700	225,867	218,967	239,869
Total	5,911,250	5,045,224	4,343,630	989,498	908,422	792,970

Bureau of Chemistry and Soils.

TABLE 493.—*Hunters' licenses issued by States, with total money returns, seasons 1930 and 1931* [1]

State	Licenses issued						Money returns	
	Resident		Nonresident and alien		Total			
	1930	1931	1930	1931	1930	1931	1930	1931
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Dollars*	*Dollars*
Alaska	(2)	(2)	214	198	[2] 214	[2] 198	[2] 14,950.00	[2] 13,290.00
Alabama	84,794	79,381	223	199	85,017	79,580	117,478.51	110,530.05
Arizona	[3] 29,175	[3] 26,978	[3] 950	[3] 291	[3] 30,125	[3] 27,269	[3] 113,602.50	[3] 75,395.00
Arkansas	83,000	62,946	1,830	1,033	84,830	63,979	112,575.00	78,426.60
California	229,767	212,876	2,203	1,466	231,970	214,342	464,157.00	423,718.50
Colorado	[3] 110,888	[3] 100,655	323	197	[3] 111,211	[3] 100,852	[3] 241,505.25	[3] 218,606.75
Connecticut	[3] 28,465	[3] 30,548	[3] 587	[3] 513	[3] 29,052	[3] 31,061	[3] 109,680.00	[3] 115,988.00
Delaware	[3] 2,193	[3] 1,686	[3] 162	113	[3] 2,355	[3] 1,799	[3] 4,623.00	[3] 3,390.00
Florida	53,155	47,670	623	566	53,778	48,236	134,060.00	119,644.00
Georgia	47,006	48,010	162	168	47,168	48,178	69,000.67	85,646.00
Idaho	86,004	[3] 88,275	506	[3] 505	86,510	[3] 88,780	171,747.65	[3] 173,446.25
Illinois	340,547	302,458	1,999	843	342,546	303,301	286,233.00	230,488.50
Indiana	[3] 318,534	[3] 304,444	[3] 415	[3] 342	[3] 318,949	[3] 304,786	[3] 292,905.00	[3] 270,261.80
Iowa	[3] 227,483	[3] 279,383	[3] 248	246	[3] 227,731	279,629	[3] 231,203.00	[3] 283,073.00
Kansas	143,539	130,474	93	130	143,632	130,604	144,934.00	131,384.00
Kentucky	106,151	84,699	395	218	106,546	84,917	94,178.00	74,174.15
Louisiana	107,844	95,494	314	275	108,158	95,769	115,794.00	102,469.00
Maine	[3] 78,959	[3] 108,205	4,639	4,050	[3] 83,598	[3] 112,255	[3] 97,521.45	[3] 113,240.00
Maryland	71,576	60,684	1,979	1,432	73,555	62,116	140,004.55	115,475.55
Massachusetts	[3] 318,861	[3] 111,192	3,585	[3] 2,855	[3] 322,446	[3] 114,047	[3] 257,138.00	[3] 291,238.00
Michigan	404,129	302,058	2,704	1,253	406,833	303,311	625,601.25	646,476.00
Minnesota	245,972	183,974	368	195	246,340	184,169	274,324.55	170,051.60
Missouri	[3] 230,714	[3] 197,118	[3] 721	[3] 558	[3] 231,435	[3] 197,676	[3] 322,180.50	[3] 244,087.70
Montana	[3] 83,388	[3] 94,816	212	167	[3] 83,600	[3] 94,983	[3] 170,700.00	[3] 163,121.80
Nebraska	[3] 187,231	[3] 182,453	441	506	[3] 187,672	[3] 182,959	[3] 191,641.00	[3] 187,509.00
Nevada	7,142	5,866	134	53	7,276	5,919	21,555.00	15,195.00
New Hampshire	[3] 53,716	[3] 54,903	[3] 2,375	[3] 2,309	[3] 56,091	[3] 57,212	[3] 134,999.00	[3] 136,213.60
New Jersey	[3] 195,216	[3] 191,848	[3] 1,755	[3] 1,404	[3] 196,971	[3] 193,252	[3] 279,336.60	[3] 273,003.60
New Mexico	[3] 18,249	[3] 19,654	[3] 1,635	[3] 1,741	[3] 19,884	[3] 21,395	[3] 98,038.25	[3] 98,540.50
New York	[3] 701,456	[3] 576,538	[3] 4,961	[3] 4,395	706,417	[3] 580,933	[3] 728,992.65	[3] 1,108,604.54
North Carolina	124,234	106,973	1,275	1,077	125,509	108,050	203,433.60	177,100.38
North Dakota	33,550	26,312	156	65	33,706	26,377	50,834.90	45,721.40
Ohio	446,329	455,518	98	71	446,427	455,589	447,799.00	456,583.00
Oklahoma	127,841	89,416	888	516	128,729	89,932	132,945.00	92,075.50
Oregon	[3] 64,314	[3] 64,056	609	445	[3] 64,923	[3] 64,501	[3] 233,778.00	[3] 225,981.00
Pennsylvania	505,103	530,392	4,823	6,009	509,926	536,401	1,029,745.70	1,095,025.30
Rhode Island	9,503	8,702	263	203	9,766	8,905	21,703.00	19,054.00
South Carolina	99,521	89,118	1,598	1,596	101,119	90,714	158,751.00	146,706.00
South Dakota	[3] 107,346	67,845	2,795	739	[3] 110,141	68,584	[3] 186,057.00	86,320.00
Tennessee	(4)	45,087	(4)	126	(4)	45,213	(4)	68,087.72
Texas	113,047	113,121	478	511	113,525	113,632	219,652.95	220,515.85
Utah	[3] 48,227	[3] 46,581	[3] 262	[3] 381	[3] 48,489	[3] 46,962	[3] 106,079.30	[3] 102,427.80
Vermont	[3] 39,737	[3] 42,871	[3] 1,141	[3] 1,211	[3] 40,878	[3] 44,082	[3] 57,644.95	[3] 61,450.85
Virginia	[3] 148,790	[3] 137,312	[3] 2,693	[3] 2,074	[3] 151,483	[3] 139,386	[3] 259,303.55	[3] 239,777.00
Washington	[3] 207,852	[3] 201,798	3,697	[3] 2,287	[3] 211,549	[3] 204,085	[3] 377,945.00	[3] 351,285.95
West Virginia	[3] 145,809	[3] 91,753	295	[3] 209	[3] 146,104	[3] 91,962	[3] 189,112.50	[3] 151,447.50
Wisconsin	204,855	171,615	314	120	205,169	171,735	195,969.50	157,463.39
Wyoming	[3] 21,169	[3] 22,635	412	[3] 374	[3] 21,581	[3] 23,009	[3] 86,044.50	[3] 79,050.90
Totals [5]	6,842,381	6,296,391	58,553	46,235	6,900,934	6,342,626	10,017,564.43	9,867,352.63

Bureau of Biological Survey.

[1] Figures are for the fiscal year or season ended in the calendar year named; figures in the 1930 columns have been revised from those shown in the 1932 Yearbook (Table 498, p. 929) for Florida, Indiana, Kentucky, New York, Utah, and Washington.
[2] No resident license required.
[3] Combined hunting and fishing license.
[4] Not available.
[5] Exclusive of Mississippi for both years and of Tennessee for 1930, as the figures are not available.

TABLE 494.—*Current status of Federal-aid road construction as of June 30, 1932*

State	Completed mileage	Under construction: Estimated total cost	Under construction: Federal aid allotted	Under construction: Percentage completed	Under construction: Mileage: Initial[1]	Under construction: Mileage: Stage[2]	Under construction: Mileage: Total	Approved for construction: Estimated total cost	Approved for construction: Federal aid allotted	Approved for construction: Mileage: Initial[1]	Approved for construction: Mileage: Stage[2]	Approved for construction: Mileage: Total	Balance of Federal-aid funds available for new projects
Alabama	2,393.9	$1,812,011.04	$884,109.47	95	74.1		74.1						$5,409,694.24
Arizona	1,220.1	2,782,928.26	2,014,700.15	64	104.9	61.7	166.6	$4,594.57	$3,459.24		0.3	0.3	742,533.48
Arkansas	1,960.2	2,452,768.24	1,127,328.92	82	64.7	45.1	109.8	404,816.95	201,796.90	17.4		17.4	2,162,507.23
California	2,328.6	10,475,483.57	4,985,605.01	54	211.3	52.0	263.3	1,475,029.90	645,642.39	44.4	7.0	51.4	32,940.23
Colorado	1,603.2	4,355,182.99	2,276,199.42	75	171.4	50.8	222.2	73,822.81	41,458.88	7.5		7.5	2,057,603.69
Connecticut	281.7	4,362,762.05	1,613,060.26	74	30.2		30.2	563,726.40	263,977.96	7.7		7.7	390,452.51
Delaware	345.7	870,529.25	435,264.62	59	41.2		41.2	86,524.00	43,262.00	4.7		4.7	167,140.82
Florida	638.0	3,563,837.58	1,659,559.53	85	102.1		102.1	655,532.89	327,766.42	17.3		17.3	2,541,174.33
Georgia	3,068.4	6,410,060.34	2,999,196.48	61	160.3	166.8	327.1	174,461.46	87,230.72	6.5	1.2	7.7	1,345,949.03
Idaho	1,460.3	2,573,893.23	1,517,125.45	77	123.5	93.7	217.2	1,302,449.66	781,761.33	30.8	228.7	259.5	345,018.54
Illinois	2,649.2	25,384,659.55	11,764,654.34	76	751.9	36.8	788.7	3,495,560.26	1,569,434.05	125.4	5.2	130.6	1,310,641.51
Indiana	1,822.0	10,326,406.44	5,114,814.33	63	352.4	20.5	372.9	1,609,394.59	792,712.22	73.7		73.7	381,104.02
Iowa	3,350.2	3,512,604.68	1,639,295.18	30	178.3	40.4	218.7	2,294,536.74	1,072,924.03	106.9	25.4	132.3	87,585.99
Kansas	3,643.0	5,160,560.54	2,521,332.53	64	293.4	68.2	361.6	2,324,281.14	1,126,345.63	72.3	304.6	376.9	567,001.31
Kentucky	1,911.0	2,439,460.44	1,079,480.86	74	144.2	4.0	148.2	1,399,504.67	525,166.87	17.3	107.8	125.1	1,182,786.01
Louisiana	1,566.8	7,471,657.46	3,511,759.18	46	87.0	10.6	97.0	1,103,383.51	538,516.32	29.8	13.3	43.1	321,408.48
Maine	720.4	3,348,521.01	1,423,360.93	52	82.9		82.9	887,397.91	431,757.49	34.3		34.3	137,272.92
Maryland	778.9	701,917.80	255,754.94	81	23.4	.6	24.0	1,633,360.88	691,459.64	60.4	5.6	66.0	8,964.30
Massachusetts	817.3	7,129,265.67	2,897,641.92	68	71.3	.2	71.5						602,611.77
Michigan	2,071.5	9,062,647.19	4,102,775.75	70	395.4	31.9	427.3	655,889.46	325,630.00	21.4	20.1	41.5	2,452,326.98
Minnesota	3,956.1	11,284,587.17	3,749,501.38	33	204.9	296.8	501.7	842,326.55	229,800.00	15.7	20.2	35.9	
Mississippi	1,809.0	3,910,633.74	1,915,689.81	85	171.2	68.8	240.0	116,017.23	58,008.61	16.1		16.1	5,152,976.98
Missouri	2,922.0	7,031,555.37	3,036,644.01	41	191.0	88.3	279.3	689,291.30	329,813.03	25.1	11.9	37.0	567,602.87
Montana	2,724.3	4,576,161.82	2,572,131.43	75	397.7	31.5	429.2	67,501.64	36,033.68	5.7	4.2	9.9	3,465,267.40
Nebraska	4,255.2	3,329,003.58	1,650,271.38	73	151.9	26.1	178.0	1,817,311.97	845,048.65	28.1	111.6	139.7	1,849,946.51
Nevada	1,281.2	1,576,562.30	1,289,906.62	81	21.2	163.0	184.2	859,152.00	693,501.34	26.8	33.3	60.1	86,974.21
New Hampshire	421.0	339,864.67	140,869.77	85	9.5	2.5	12.0						553,268.42
New Jersey	616.5	4,716,807.19	1,770,638.23	56	34.3	.5	34.8	1,023,047.07	496,650.88	.9		.9	698,945.91
New Mexico	2,250.1	1,469,046.56	1,028,823.23	92	61.9	17.8	79.7	998,601.99	618,039.80	41.1	42.3	83.4	897,851.56
New York	3,273.4	14,125,400.00	6,352,125.00	50	334.3		334.3	6,402,600.00	2,462,500.00	135.9		135.9	2,250,042.54
North Carolina	2,226.4	1,152,326.37	567,278.11	77	67.6	5.0	72.6	300,312.76	150,156.36	7.1	4.0	11.1	3,728,867.35
North Dakota	5,062.7	3,316,919.40	1,680,534.96	45	383.7	283.5	667.2	1,931,160.99	973,516.22	183.5	478.4	661.9	821,723.31
Ohio	2,858.4	6,314,566.20	2,097,263.73	79	101.7	26.4	128.1	6,292,605.00	2,240,240.53	153.0	46.4	199.4	1,682,314.29
Oklahoma	2,295.2	3,478,222.78	1,625,741.63	84	157.3	45.0	202.3	1,713,059.54	877,359.08	112.5	17.6	130.1	1,276,063.13
Oregon	1,522.8	4,145,699.29	2,305,513.64	85	128.0	47.1	175.1	1,590,510.22	864,268.36	46.9	74.8	121.7	875,392.92
Pennsylvania	3,012.6	5,021,298.77	2,322,443.57	35	181.7		181.7	6,392,381.18	2,851,912.0[illegible]	196.7		196.7	775,956.02
Rhode Island	255.6	926,504.82	459,140.00	60	16.7	2.2	18.9						325,565.85
South Carolina	2,018.6	3,131,546.27	1,409,414.06	94	73.2	59.7	132.9	101,152.78	50,000.00	5.2		5.2	744,636.09

South Dakota	4,039.4	3,318,617.13	1,909,863.88	70	266.1	183.8	449.9	233,615.05	157,987.24	30.8	12.0	42.8	1,085,351.79
Tennessee	1,682.4	1,427,533.89	697,948.21	57	48.7	6.4	55.1	733,446.20	356,461.69	17.1	21.8	38.9	3,157,110.04
Texas	7,802.7	13,843,589.36	6,348,479.78	69	605.0	223.6	828.6	3,980,124.61	1,802,196.04	232.1	185.1	417.2	3,333,824.82
Utah	1,203.5	1,109,608.87	797,552.81	67	84.9	27.7	112.6	847,650.66	635,771.92	37.6	108.5	146.1	520,628.78
Vermont	339.1	1,408,800.97	630,501.86	19	45.6	----	45.6	7,618.95	3,809.47	----	----	----	----
Virginia	1,922.9	1,915,279.75	957,639.81	69	113.5	6.2	119.7	754,053.46	298,883.54	22.9	21.5	44.4	1,817,277.70
Washington	1,197.9	2,915,547.20	1,432,094.35	62	106.2	14.5	120.7	519,285.07	213,800.00	11.5	5.3	16.8	1,007,069.51
West Virginia	893.3	1,783,964.82	758,721.07	71	44.5	10.5	55.0	283,803.90	132,744.79	6.2	----	6.2	998,160.51
Wisconsin	2,593.8	7,833,923.20	3,203,398.32	41	204.8	75.4	280.2	1,110,874.93	432,400.00	29.6	23.5	53.1	283,938.52
Wyoming	1,894.3	3,630,824.28	2,232,041.40	72	192.4	230.9	423.3	205,019.30	134,595.13	26.2	20.1	46.3	120,711.31
Hawaii	76.3	811,202.36	395,047.85	65	22.0	----	22.0	740,008.72	598,548.44	18.8	3.6	22.4	1,335,908.87
Total	101,032.1	234,042,724.44	109,230,238.67	64	7,885.4	2,626.5	10,511.9	60,696,780.57	28,014,349.16	2,110.9	1,965.3	4,076.2	61,720,100.60
Construction completed	----	*148,147,000*	69,982,000	----	----	----	----	----	----	----	----	----	----
Balance uncompleted	----	85,896,000	39,248,000	----	----	----	----	----	----	----	----	----	----

Bureau of Public Roads.

[1] Initial Federal-aid construction refers to projects which are being improved with Federal aid for the first time. Such projects may or may not have been previously improved.

[2] The term "stage construction" refers to additional work done on projects previously improved with Federal aid. In general, such additional work consists of the construction of a surface of higher type than was provided in the initial improvement.

TABLE 495.—*Mileage of roads in State highway systems, including Federal-aid system, at end of 1931, and total mileage 1921, 1923–1931, as reported by State highway departments*

State and year	Total system mileage	Earth nonsurfaced: Unimproved	Earth nonsurfaced: Improved to grade	Surfaced roads by types: Total surfaced mileage	Sand-clay, top-soil	Gravel, chert, etc.	Water-bound macadam (treated and untreated)	Bituminous macadam	Bituminous concrete (including sheet asphalt)	Portland cement concrete	Brick and block
	Miles	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*	*Miles*
Alabama	5,548	882	676	3,990	1,024	1,906	22	166	153	719	------
Arizona	2,747	473	300	1,974	190	1,550	------	24	68	142	------
Arkansas	8,705	636	786	7,283	------	5,818	------	108	494	863	------
California	7,389	1,815	394	5,180	------	2,074	------	450	807	1,849	------
Colorado	9,255	4,195	410	4,650	66	4,138	------	------	15	431	------
Connecticut	2,291	------	97	2,194	------	290	906	308	155	533	2
Delaware	876	------	4	872	------	49	20	48	18	731	6
Florida	8,338	3,098	374	4,866	868	25	2,649	155	319	521	329
Georgia	7,131	2,608	456	4,067	1,750	697	253	408	197	761	1
Idaho	4,788	1,119	497	3,172	34	2,904	------	24	155	55	------
Illinois	10,080	1,575	144	8,361	------	6	1	3	15	8,133	203
Indiana	6,972	------	201	6,771	------	2,203	941	558	47	2,925	97
Iowa	8,312	687	281	7,344	------	3,282	------	------	------	4,029	33
Kansas	8,982	3,810	366	4,806	3,130	418	------	174	3	919	162
Kentucky	5,950	------	752	5,198	------	1,176	2,578	818	21	601	4
Louisiana	17,167	6,340	306	10,521	------	9,259	------	16	152	1,088	6
Maine	2,032	90	9	1,933	4	1,537	3	235	------	154	------
Maryland	3,412	------	------	3,412	------	560	1,143	78	165	1,465	1
Massachusetts	1,699	------	------	1,699	------	55	179	896	235	331	3
Michigan	8,293	403	270	7,620	104	3,429	503	97	380	3,096	11
Minnesota	6,867	21	79	6,767	77	4,815	------	------	76	1,783	16
Mississippi	6,078	165	670	5,243	1	4,710	11	51	21	436	13
Missouri	9,167	855	729	7,583	------	4,476	------	141	------	2,945	21
Montana	8,148	5,178	324	2,646	51	2,536	------	17	7	35	------
Nebraska	9,752	3,541	579	5,632	9	5,070	------	------	17	485	51
Nevada	3,797	1,828	131	1,838	------	1,759	------	26	11	42	------
New Hampshire	2,683	5	31	2,647	------	2,127	104	163	46	207	------
New Jersey	1,877	182	15	1,680	------	65	53	16	260	1,235	51
New Mexico	9,272	4,730	1,646	2,896	------	2,808	------	------	1	87	------
New York	14,000	2,311	4	11,685	------	101	1,430	3,438	709	5,794	213
North Carolina	9,752	112	1,240	8,400	3,258	569	230	663	1,029	2,632	19
North Dakota	7,586	2,231	1,291	4,064	------	4,042	------	------	1	21	------
Ohio	11,559	82	7	11,470	------	4,175	1,240	1,637	500	2,411	1,507
Oklahoma	6,850	2,188	619	4,043	------	2,193	------	------	275	1,535	40
Oregon	4,468	263	440	3,765	------	2,382	------	463	692	228	------
Pennsylvania	13,563	------	2,570	10,993	------	1,363	2,669	404	473	5,725	359
Rhode Island	1,046	258	185	603	------	26	96	228	122	131	------
South Carolina	5,956	424	196	5,336	2,474	693	43	4	445	1,677	------
South Dakota	5,957	508	997	4,452	21	4,299	------	------	5	127	------
Tennessee	7,053	121	1,035	5,897	------	2,361	1,124	901	218	1,276	17
Texas	18,868	4,849	2,434	11,585	730	5,375	877	409	1,613	2,533	48
Utah	4,108	452	1,243	2,413	------	2,061	------	6	82	264	------
Vermont	1,013	------	------	1,013	------	575	------	195	------	243	------
Virginia	8,032	1,637	201	6,194	565	2,597	1,430	790	67	745	------
Washington	3,759	270	116	3,373	------	2,354	------	------	40	968	11
West Virginia	4,315	591	449	3,275	------	1,013	42	1,093	160	867	100
Wisconsin	10,218	------	895	9,323	46	4,943	610	145	16	3,562	1
Wyoming	3,231	786	474	1,971	------	1,936	------	------	27	8	------
Total, 1931	328,942	61,319	24,923	242,700	14,402	112,800	19,157	15,356	10,312	67,348	3,325
Total:											
1930	[2] 324,498	69,910	27,816	226,772	15,153	107,277	20,229	14,590	8,071	58,208	3,244
1929	[2] 314,163	77,259	28,899	208,005	15,442	98,947	18,891	14,054	7,234	50,169	3,258
1928	306,442	81,549	31,755	193,138	13,499	93,124	18,142	15,200	6,890	42,957	3,326
1927	293,353	86,817	29,970	176,566	12,581	86,095	17,752	13,496	6,398	36,915	3,329
1926	287,928	96,413	28,456	163,059	11,396	79,286	18,428	12,927	5,705	31,936	3,381
1925	274,911	103,271	26,786	144,854	11,025	68,771	16,709	12,105	5,414	27,845	3,185
1924	261,216	94,651	34,456	132,109	10,446	63,158	17,033	10,346	5,211	22,825	3,090
1923	251,611	103,843	36,368	111,400	8,875	52,917	15,422	8,847	4,558	17,916	2,865
1921	209,242	102,963	21,421	[1] 84,858	8,622	36,458	16,978	6,749	2,840	10,114	2,089

Bureau of Public Roads.

[1] Includes 1,008 miles of miscellaneous surfacing not allocated by types.
[2] Revised figures.

TABLE 496.—*Total State highway income and funds available, 1931, as reported by State authorities*

State	Total funds available	Balances at first of year	Total income for State highways	Current revenue from State sources				Contributions from other than State sources		Loans
				State taxes and appropriations	Motor-vehicle fees	Gasoline-tax receipts	Miscellaneous revenue	Federal-aid and emergency advance funds used	Transfers from counties	State highway bonds and notes sold
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	13, 599	2, 282	11, 317	-------	2, 677	3, 484	332	4, 317	507	-------
Arizona	7, 676	98	7, 578	1, 365	703	1, 878	11	3, 560	61	-------
Arkansas	25, 665	8, 544	17, 121	-------	3, 539	5, 702	69	5, 811	-------	2, 000
California	49, 217	11, 995	37, 222	4, 514	3, 910	23, 935	-------	4, 494	369	-------
Colorado	12, 593	1, 942	10, 651	471	939	4, 220	48	4, 793	180	-------
Connecticut	9, 054	1, 164	7, 890	-------	4, 612	2, 172	96	597	413	-------
Delaware	5, 011	217	4, 794	1, 267	1, 106	1, 071	20	1, 330	-------	-------
Florida	12, 976	1, 075	11, 901	-------	3, 243	5, 572	10	2, 832	244	-------
Georgia	21, 352	1, 639	19, 713	-------	4, 156	8, 885	111	5, 513	1, 048	-------
Idaho	8, 200	144	8, 056	766	181	2, 972	62	3, 525	550	-------
Illinois	58, 941	10, 037	48, 904	224	19, 201	19, 085	330	10, 064	-------	-------
Indiana	27, 202	1, 529	25, 673	-------	5, 975	13, 422	1, 123	5, 153	-------	-------
Iowa	42, 651	5, 876	36, 775	-------	11, 693	6, 426	5	6, 631	-------	12, 020
Kansas	20, 581	2, 519	18, 062	-------	3, 930	6, 224	24	6, 779	1, 105	-------
Kentucky	28, 267	9, 301	18, 966	290	3, 598	8, 772	550	4, 440	1, 316	-------
Louisiana	53, 005	4, 162	48, 843	-------	4, 548	7, 545	163	4, 052	82	32, 453
Maine	21, 622	526	21, 096	2, 566	2, 971	2, 203	1, 072	2, 603	5, 184	4, 497
Maryland	18, 930	2, 157	16, 773	2, 237	2, 450	6, 510	828	2, 456	1, 226	1, 066
Massachusetts	38, 612	7, 288	31, 324	459	6, 901	13, 936	106	4, 024	3, 755	2, 143
Michigan	42, 370	5, 312	37, 058	-------	14, 385	17, 041	1, 589	3, 167	876	-------
Minnesota	43, 848	7, 305	36, 543	1, 126	10, 777	8, 690	446	5, 444	-------	10, 060
Mississippi	7, 536	709	6, 827	-------	151	2, 917	51	3, 149	559	-------
Missouri	47, 328	5, 001	42, 327	-------	10, 118	9, 501	710	7, 224	103	14, 671
Montana	7, 172	−362	7, 534	-------	-------	2, 978	20	4, 163	373	-------
Nebraska	14, 399	382	14, 017	101	1, 184	6, 966	-------	5, 692	74	-------
Nevada	1, 515	−181	1, 696	101	293	375	13	731	33	150
New Hampshire	9, 876	1, 273	8, 603	-------	2, 052	2, 685	479	946	1, 441	1, 000
New Jersey	73, 925	20, 330	53, 595	6, 538	7, 230	11, 596	6, 163	3, 053	279	18, 736
New Mexico	9, 190	505	8, 685	237	496	2, 354	63	4, 503	32	1, 000
New York	142, 038	71, 925	70, 113	4, 801	27, 773	20, 111	91	14, 564	2, 773	-------
North Carolina	27, 771	5, 894	21, 877	-------	6, 268	12, 447	112	3, 050	-------	-------
North Dakota	7, 404	203	7, 201	503	909	1, 350	104	3, 308	1, 027	-------
Ohio	43, 103	2, 282	40, 821	-------	6, 739	23, 973	805	9, 171	43	-------
Oklahoma	17, 699	793	16, 906	-------	2, 694	7, 984	32	5, 273	923	-------
Oregon	19, 314	2, 369	16, 945	1, 125	3, 962	5, 940	131	4, 535	257	995
Pennsylvania	89, 581	8, 306	81, 275	-------	29, 866	27, 634	503	10, 264	3, 008	10, 000
Rhode Island	6, 192	1, 058	5, 134	302	2, 355	1, 489	37	951	-------	-------
South Carolina	35, 760	15, 909	19, 851	-------	2, 808	5, 981	1, 255	4, 805	-------	5, 002
South Dakota	12, 960	3, 163	9, 797	407	1, 432	3, 346	130	4, 478	4	-------
Tennessee	49, 218	25, 681	23, 537	1, 226	4, 262	9, 901	1, 364	4, 507	277	2, 000
Texas	55, 887	4, 967	50, 920	-------	4, 441	22, 959	397	11, 994	11, 129	-------
Utah	7, 167	70	7, 097	36	802	2, 463	420	2, 772	604	-------
Vermont	7, 609	−202	7, 811	1, 830	2, 354	1, 835	425	970	397	-------
Virginia	23, 184	2, 672	20, 512	2, 897	6, 173	7, 619	133	3, 394	296	-------
Washington	17, 681	-------	17, 681	-------	3, 602	9, 143	-------	3, 534	1, 402	-------
West Virginia	31, 889	8, 817	23, 072	-------	4, 703	5, 387	-------	2, 969	13	10, 000
Wisconsin	32, 808	8, 295	24, 513	8	8, 498	6, 315	224	3, 747	5, 721	-------
Wyoming	8, 392	363	8, 029	41	743	1, 189	396	2, 742	98	2, 820
Total	1, 367, 970	275, 334	1, 092, 636	35, 438	253, 403	386, 183	21, 143	218, 074	47, 782	130, 613

Bureau of Public Roads.

Table 497.—*Total State highway and bridge disbursements, 1931, as reported by State authorities*

State	Grand total disbursements	Expenditures for State highway purposes						Other disbursements by State highway departments		
		Total expenditures	Capital investment in construction and right of way	Maintenance	Equipment and machinery	Miscellaneous expenses	Interest on bonds	Retirement of bonds	Transfers to counties, etc.	Other obligations imposed by statutes
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	14,523	13,116	9,054	1,483	334	8	2,237	1,299		108
Arizona	7,242	6,853	5,382	1,242	229					389
Arkansas	26,291	20,769	10,666	1,801	250		8,052	3,638	1,875	9
California	36,815	35,040	26,244	6,006	51		2,739	1,775		
Colorado	11,862	10,518	8,335	1,453	340		390	1,344		
Connecticut	5,653	5,097	3,447	1,394	81	175			42	514
Delaware	4,425	2,927	2,168	235	59		465	1,340		158
Florida	12,070	11,767	9,169	2,467	131					303
Georgia	17,468	17,444	14,812	2,211	419	2				24
Idaho	7,717	6,501	5,200	1,094	75		132	859		357
Illinois	42,622	38,346	28,438	3,446	502	65	5,895	2,000	1,467	809
Indiana	20,771	19,171	15,745	2,744	682			1,600		
Iowa	36,827	35,198	28,082	3,362			3,754	1,593		36
Kansas	17,448	17,246	12,382	3,218	1,646				10	192
Kentucky	23,551	22,952	18,082	3,720	704	10	436	430		169
Louisiana	50,033	47,217	39,172	4,744	1,136	23	2,142	2,591		225
Maine	18,442	11,472	7,631	1,678	738	553	872	631	5,777	562
Maryland	16,152	13,292	10,409	1,789	239		855	1,382		1,478
Massachusetts	28,324	14,477	10,840	3,016	338		283	274	7,576	5,997
Michigan	36,540	34,635	25,017	6,650	719		2,249	1,833		72
Minnesota	36,578	31,108	23,197	5,534	788		1,589	3,294	1,776	400
Mississippi	6,874	6,866	4,846	1,828	192					8
Missouri	42,841	39,514	31,577	4,076	580		3,281	2,022	40	1,265
Montana	7,173	7,146	6,088	818	240					27
Nebraska	13,718	13,622	10,535	2,902	185					96
Nevada	1,695	1,510	1,149	311	29		21	171	7	7
New Hampshire	8,489	7,835	2,794	4,810	58		173	400	218	36
New Jersey	52,860	48,851	40,576	3,185	96	1,329	3,665	3,919		90
New Mexico	8,762	8,242	5,941	1,515	107	263	416	520		
New York	73,924	70,004	57,496	9,404	1,868	58	1,178	3,920		
North Carolina	26,193	20,429	10,924	3,960		753	4,792	2,663	2,946	155
North Dakota	6,957	5,807	4,433	1,236	134		4	400	750	
Ohio	34,161	32,466	21,565	10,901				1,000		695
Oklahoma	15,047	14,777	11,974	2,335	468				270	
Oregon	17,136	13,879	10,385	2,078		29	1,387	1,975	1,138	144
Pennsylvania	65,531	57,641	36,560	11,591	5,050	567	3,873	3,000	831	4,059
Rhode Island	6,188	6,061	3,863	1,712	103	139	244	59	66	2
South Carolina	31,681	26,257	22,872	2,113	122	93	1,057	184	4,941	299
South Dakota	12,674	8,703	6,579	1,936	7	27	154	3,000	839	132
Tennessee	41,209	37,979	26,869	4,534	1,431		5,145	2,559		671
Texas	42,164	41,204	30,372	10,330	397	105				960
Utah	6,824	6,350	4,505	1,237	260	12	336	438		36
Vermont	6,999	6,276	4,154	1,564	280		278	400	306	17
Virginia	22,022	20,601	14,231	5,973		99	298	1,000		421
Washington	17,681	15,598	12,381	3,006	211				2,083	
West Virginia	24,385	20,775	14,111	3,321	17		3,326	3,400	12	198
Wisconsin	19,371	19,359	15,295	4,047	15	2				12
Wyoming	7,097	6,694	5,408	970	172		144	365		38
Total	1,091,010	979,592	730,955	160,980	21,483	4,312	61,862	57,278	32,970	21,170

Bureau of Public Roads.

TABLE 498.—*Motor-vehicle registration and revenues, 1931, as reported by State authorities*

State	Registered motor vehicles			Gross registration receipts	Disposition of gross receipts [1]			
	All motor cars and trucks	Passenger autos, taxis, and busses	Motor trucks and road tractors		Collection costs	State highways	Local roads	On road bonds and miscellaneous
	Number	*Number*	*Number*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	246,465	212,493	33,972	3,370	139	1,186	604	1,450
Arizona	105,572	92,939	12,633	768	190	678	-----	-----
Arkansas	180,731	149,456	31,275	3,496	-----	-----	-----	3,496
California	2,043,281	1,798,068	245,213	9,763	1,346	3,334	3,334	1,749
Colorado	308,458	276,376	32,082	1,911	163	874	874	-----
Connecticut	336,040	284,081	51,959	8,260	719	7,541	-----	-----
Delaware	55,202	45,211	9,991	1,043	-----	505	-----	538
District of Columbia	173,519	155,334	18,185	623	140	-----	-----	483
Florida	323,260	271,536	51,724	4,852	293	4,128	216	215
Georgia	320,840	274,576	46,264	4,257	212	4,045	-----	-----
Idaho	111,663	96,228	15,435	1,909	57	180	1,672	-----
Illinois	1,612,770	1,411,261	201,509	18,427	-----	10,532	-----	7,895
Indiana	862,672	732,846	129,826	6,332	357	5,975	-----	-----
Iowa	748,438	670,024	78,414	12,540	374	11,789	-----	377
Kansas	559,176	478,692	80,484	6,060	301	3,869	1,890	-----
Kentucky	327,326	292,357	34,969	4,842	470	3,757	615	-----
Louisiana	263,050	215,267	47,783	4,549	50	4,160	-----	339
Maine	188,238	149,467	38,771	3,184	337	1,362	-----	1,485
Maryland	325,372	289,292	36,080	3,498	350	2,518	-----	630
Massachusetts	840,190	736,302	103,888	7,000	1,581	4,737	-----	682
Michigan	1,230,980	1,078,345	152,635	21,821	1,065	13,041	6,000	1,715
Minnesota	720,401	611,966	108,435	10,785	400	4,786	-----	5,599
Mississippi	183,650	152,929	30,721	2,421	164	153	2,104	-----
Missouri	752,805	656,830	95,975	10,140	527	5,331	-----	4,282
Montana	127,166	103,129	24,037	1,499	32	-----	1,467	-----
Nebraska	416,131	356,283	59,848	3,742	115	1,088	2,539	-----
Nevada	32,168	25,218	6,950	388	43	181	-----	164
New Hampshire	111,510	92,839	18,671	2,257	201	2,056	-----	-----
New Jersey	869,867	736,506	133,361	15,891	1,126	7,229	7,310	226
New Mexico	81,325	65,441	15,884	1,248	99	689	460	-----
New York	2,297,249	1,966,436	330,813	41,878	937	30,777	6,100	4,064
North Carolina	428,737	374,162	54,575	6,165	135	2,552	-----	3,478
North Dakota	171,293	144,705	26,588	1,799	73	1,019	707	-----
Ohio	1,710,625	1,518,696	191,929	12,819	497	6,041	6,281	-----
Oklahoma	482,725	428,140	54,585	5,857	242	2,250	3,365	-----
Oregon	278,225	255,275	22,950	6,941	468	1,492	1,618	3,363
Pennsylvania	1,741,942	1,522,130	219,812	31,607	3,297	23,262	-----	5,048
Rhode Island	137,878	118,313	19,565	2,273	266	1,933	74	-----
South Carolina	203,719	180,280	23,439	2,790	65	2,555	-----	170
South Dakota	193,025	169,509	23,516	2,808	80	1,372	1,356	-----
Tennessee	350,520	316,544	33,976	4,581	86	2,133	2,133	229
Texas	1,297,301	1,086,310	210,991	13,995	672	4,451	8,872	-----
Utah	108,958	91,381	17,577	828	68	-----	-----	760
Vermont	83,877	75,424	8,453	2,356	-----	2,356	-----	-----
Virginia	379,227	322,594	56,633	6,159	241	5,731	-----	187
Washington	420,878	360,796	60,082	7,624	584	2,183	4,421	436
West Virginia	253,308	213,949	39,359	4,520	237	883	-----	3,400
Wisconsin	754,249	640,476	113,773	11,725	800	3,558	6,121	1,246
Wyoming	62,101	51,388	10,713	728	-----	562	-----	166
Total	25,814,103	22,347,800	3,466,303	344,338	19,689	200,734	70,043	53,872

Bureau of Public Roads.

[1] These figures do not always agree with those shown on highway income tables, because of time of disposition and use of fiscal years.

TABLE 499.—*Gasoline taxes, 1931, as reported by State authorities*

State	Total tax (refunds deducted)	Disposition of total taxes collected					Gallons consumed by motor vehicles	Tax rate per gallon
		Collection costs	Construction, etc.		State and county road-bond payments	Miscellaneous		
			State highways [1]	Local roads [1]				
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 gallons*	*Cents*
Alabama	7, 197	16	2, 204	3, 249	1, 728		162, 671	5
Arizona	3, 204		2, 227	977			64, 702	5
Arkansas	6, 448	20	200	788	5, 282	158	110, 579	6
California	39, 864	125	26, 468	13, 234		37	1, 328, 788	3
Colorado	6, 254	67	4, 331	1, 670		186	156, 358	4
Connecticut	4, 777		4, 777				236, 400	2
Delaware	1, 072		534		538		35, 735	3
District of Columbia	1, 726					1, 726	86, 315	2
Florida	15, 018	32	5, 781	424	5, 781	3, 000	235, 057	7
Georgia	13, 314	4	8, 873	2, 219		2, 218	221, 892	6
Idaho	2, 609	30	2, 326		242	11	51, 967	5
Illinois	29, 066	107	19, 306	9, 653			968, 856	3
Indiana	18, 044	67	13, 482	3, 371		1, 124	450, 864	4
Iowa	10, 928	63	6, 373	4, 492			364, 253	3
Kansas	8, 071		6, 271	1, 800			269, 029	3
Kentucky	8, 813	31	8, 782				176, 203	5
Louisiana	9, 398	62	4, 792		2, 664	1, 880	187, 956	5
Maine	4, 439	33	2, 203	2, 203			109, 568	4
Maryland	7, 431	21	5, 868			1, 542	185, 775	4
Massachusetts	15, 306		12, 536	902		1, 868	558, 556	3
Michigan	21, 873	55	14, 707	4, 071	3, 000	40	727, 745	3
Minnesota	11, 070		7, 380	3, 690			369, 005	3
Mississippi	6, 009	11	2, 902	2, 871		225	115, 640	5½
Missouri	9, 207	49	9, 158				460, 328	2
Montana	3, 018	27	2, 970		21		60, 363	5
Nebraska	9, 096	11	6, 814	2, 271			227, 406	4
Nevada	778		778				19, 448	4
New Hampshire	2, 657		1, 993		664		66, 429	4
New Jersey	17, 173	19	11, 637		427	5, 090	570, 821	3
New Mexico	2, 686	60	1, 686		930	10	53, 294	5
New York	30, 589	50	22, 904	6, 108		1, 527	1, 527, 203	2
North Carolina	14, 024	9	4, 379	2, 639	6, 401	596	249, 609	6
North Dakota	2, 032	33	1, 332	666		1	67, 675	3
Ohio	39, 328	108	22, 061	9, 805		7, 354	983, 201	4
Oklahoma	11, 665	72	7, 249	2, 416		1, 928	252, 483	5
Oregon	6, 187	18	6, 169				155, 063	4
Pennsylvania	33, 189	765	23, 423	5, 564	3, 437		1, 081, 756	3
Rhode Island	1, 896		1, 422		474		94, 632	2
South Carolina	7, 246		4, 796	1, 208	1, 242		120, 766	6
South Dakota	3, 395	49	3, 346				84, 867	4
Tennessee	11, 461	57	4, 210	2, 995	4, 199		206, 707	7
Texas	30, 515		22, 886			7, 629	762, 864	4
Utah	2, 310	5	2, 305				60, 363	4
Vermont	1, 967		1, 563		279	125	49, 164	4
Virginia	11, 445		8, 012	3, 433			228, 904	5
Washington	11, 032		8, 587	2, 445			244, 530	5
West Virginia	5, 395	15	2, 054		3, 326		134, 680	4
Wisconsin	15, 780	20	8, 830	4, 515	1, 797	618	431, 505	4
Wyoming	1, 587	6	1, 130	395	56		39, 675	4
Total	537, 589	2, 117	354, 017	100, 074	42, 488	38, 893	15, 407, 650	3. 48

Bureau of Public Roads.

[1] These figures do not always agree with those shown on highway income tables because of time of disposition and use of fiscal years.

TABLE 500.—*Annual average rate in cents per hour for common labor employed on Federal-aid highway projects, 1923–1932*

Year	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	United States
	Cents per hour	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*	*Cents per hour*
1923	53	47	41	36	27	23	25	41	54	39
1924	49	43	40	36	28	24	27	40	53	38
1925	46	43	37	37	27	25	26	44	52	38
1926	49	47	38	36	29	25	27	44	52	38
1927	49	47	39	37	28	25	30	45	53	40
1928	49	43	39	38	26	26	28	46	52	41
1929	51	43	39	37	28	26	31	47	53	39
1930	50	42	38	37	25	24	28	47	53	39
1931	45	37	36	35	22	20	23	45	51	36
1932	35	36	36	32	19	19	26	44	48	32

Bureau of Public Roads.

TABLE 501.—*Fertilizer materials: Sales and production of agricultural lime, phosphate rock, sulphur, and pyrites, in quantity and value, United States, 1929–1931*

Item	Quantity			Value		
	1929	1930	1931	1929	1930	1931
Agricultural lime and liming materials sold: [1]						
Lime from limestone—	*Short tons*	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*
Quicklime	89, 654	91, 521	297, 312 (Quicklime and Hydrated)	448, 634	512, 383	1, 924, 149 (Quicklime and Hydrated)
Hydrated	248, 675	251, 590		1, 939, 267	1, 800, 396	
Lime from oyster shells [2]	14, 000	15, 000		119, 000	135, 000	
Limestone pulverized	2, 654, 580	2, 542, 100		3, 764, 775	3, 309, 329	
Calcareous marl	38, 090	34, 012		130, 866	112, 523	
Total	3, 045, 899	2, 934, 223		6, 402, 542	5, 929, 631	
Phosphate rock sold or used: [3]						
Sold for direct application to the soil	*Long tons* 61, 224	*Long tons* 41, 593	*Long tons*			
Florida—						
Hard rock	72, 424	81, 753	57, 224	267, 218	517, 229	380, 540
Land pebble [4]	3, 015, 874	3, 166, 318	2, 004, 242	9, 633, 856	10, 273, 076	6, 821, 546
Tennessee—						
Brown and blue rock	633, 939	611, 045	343, 622	3, 097, 104	2, 938, 525	1, 545, 607
Other States [5]	*38, 618*	*67, 276*	*129, 871*	*155, 081*	*268, 000*	*540, 792*
Total	3, 760, 855	*3, 926, 392*	*2, 534, 959*	*13, 153, 259*	*13, 996, 830*	*9, 288, 485*
Sulphur produced	2, 382, 389	2, 588, 981	2, 128, 930			
Sulphur sold	2, 437, 238	1, 989, 917	1, 376, 526	[6] 43,800, 000	[6] 35,800, 000	[6] 24,800, 000
Pyrites produced	333, 465	347, 512	330, 848	1, 250, 141	1, 028, 680	974, 820

Bureau of Agricultura lEconomics. Compiled from reports of the Bureau of Mines. Figures for earlier years appear in previous issues of the Yearbook.

[1] Sold by producers. (Includes a small amount sold by Hawaii and Puerto Rico producers.)
[2] Partly estimated.
[3] Sold or used by producers.
[4] Includes soft rock.
[5] Idaho, Wyoming, and Montana.
[6] Approximate.

TABLE 502.—*Fertilizer: Consumption in the United States, by States, 1921–1931*

State and division	Calendar year [1]										
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931 [2]
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Maine	[3] 151	[3] 172	[3] 168	[3] 182	[3] 185	147	184	[4] 179	186	196	195
New Hampshire [3]	14	15	17	16	16	15	17	17	[5] 12	11	11
Vermont	[3] 15	[3] 16	[3] 18	[3] 17	[3] 18	[3] 18	16	17	15	16	15
Massachusetts	61	66	64	62	63	59	72	71	[5] 69	72	65
Rhode Island [4]	8	8	9	9	9	8	10	10	[5] 8	8	7
Connecticut	[4] 70	[3] 70	[3] 70	[3] 70	[3] 70	[3] 70	[3] 65	[3] 72	[5] 69	[3] 69	[3] 65
New York	[4] 230	[4] 250	[4] 250	[4] 250	253	234	260	[4] 260	[5] 288	[4] 288	[4] 260
New Jersey	163	177	157	153	147	135	142	144	[5] 162	170	151
Pennsylvania	321	322	309	320	328	329	327	340	[5] 348	348	320
North Atlantic	1,033	1,096	1,062	1,079	1,089	1,015	1,093	1,110	1,157	1,178	1,089
Ohio	255	311	303	321	322	305	313	321	339	327	249
Indiana [6]	188	209	198	192	226	228	240	221	250	224	166
Illinois	[4] 12	14	17	17	25	25	[4] 26	31	38	41	32
Michigan	83	86	84	95	109	105	117	[4] 150	[4] 153	[4] 145	[4] 115
Wisconsin	13	14	15	15	12	16	23	33	41	51	46
Minnesota	[4] 4	[4] 6	[4] 7	[4] 8	[4] 9	11	11	14	[5] 16	16	15
Iowa	[4] 3	[4] 4	[4] 4	[4] 5	[3] 6	[7] 6	[7] 7	[3] 10	[5] 21	[3] 25	[3] 22
Missouri [6]	51	50	52	47	64	57	56	65	59	60	49
Kansas	[4] 4	[4] 4	[4] 5	[4] 5	[3] 4	8	[4] 8	9	[6] 10	[6] 6	[6] 3
Other States	1	1	1	1	1	1	1	1	2	3	2
North Central	614	699	686	706	778	702	802	855	929	898	699
Delaware	38	40	37	36	41	43	41	41	[5] 43	43	39
Maryland	140	156	155	151	165	163	173	165	[5] 180	192	146
Virginia [6]	370	450	422	442	452	435	408	438	430	449	379
West Virginia [4]	29	38	40	40	41	43	44	50	[5] 46	45	40
North Carolina [6]	691	951	1,066	1,183	1,218	1,218	1,171	1,349	1,294	1,242	1,003
South Carolina [6]	599	527	693	844	873	840	727	788	750	749	599
Georgia [6]	536	522	676	679	779	780	713	883	869	929	686
Florida [6]	291	354	398	365	359	399	417	469	427	489	419
South Atlantic	2,694	3,038	3,487	3,740	3,928	3,921	3,686	4,191	4,049	4,138	3,311
Kentucky	62	85	90	85	93	92	70	90	93	114	105
Tennessee [6]	64	90	106	115	142	156	112	151	143	164	119
Alabama [6]	168	284	448	457	598	615	478	681	675	644	420
Mississippi [6]	61	143	208	206	258	278	219	333	328	404	197
Arkansas [5]	22	36	80	97	123	126	75	129	157	158	82
Louisiana [6]	36	75	105	125	111	114	93	144	174	176	94
Oklahoma	[4] 2	[4] 2	[4] 4	[4] 4	[3] 5	[3] 6	[3] 4	[6] 8	[6] 9	[6] 7	[6] 7
Texas [6]	22	34	79	128	101	125	81	145	192	145	65
South Central	437	749	1,120	1,217	1,431	1,512	1,132	1,678	1,771	1,812	1,089
Washington	[3] 5	[3] 4	[3] 5	[3] 7	[4] 10	12	14	[4] 16	[5] 21	[4] 22	[4] 18
Oregon	[4] 6	[4] 8	[4] 8	[4] 8	[4] 8	[4] 8	[4] 9	[3] 10	[5] 12	[3] 12	[3] 11
California	73	75	72	66	86	94	103	121	130	142	128
Other States	1	1	2	2	3	4	4	4	[5] 10	10	15
Western	85	88	87	83	107	118	130	151	173	186	172
United States	4,863	5,670	6,442	6,825	7,333	7,328	6,843	7,985	8,079	8,212	6,340

Bureau of Agricultural Economics. Compiled from reports of the National Fertilizer Association, published in the Fertilizer Review, May–June, 1931, and April–June, 1932. Based on fertilizer tag sales or sale records, or estimates, as shown in footnotes.

[1] Except as follows: New Hampshire, Massachusetts, Idaho, and Oklahoma (1920–1927), year ended June 30. Rhode Island, year ended Mar. 31; New Jersey, year ended Oct. 31.
[2] Preliminary.
[3] Estimated by State authorities.
[4] Estimated.
[5] Agricultural census.
[6] Based on tag sales.
[7] Total of four companies plus estimates for others.

TABLE 503.—*Fertilizer and fertilizer materials: Production, sales, imports, exports, and consumption, United States, 1927–1931*

Item	1927	1928	1920	1930	1931[1]
Sulphate of ammonia (equivalent of all forms):	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Production[2]	717,460	798,887	856,214	769,022	569,986
Sales[2]	741,860	764,355	827,674	746,031	578,475
Imports for consumption	19,211	42,133	21,338	39,160	127,909
Exports	155,335	104,177	162,132	91,461	74,950
Nitrate of soda, imports for consumption	838,636	1,156,860	1,042,113	643,881	616,687
Sulphuric acid:					
Production[3]	1,656,871	2,126,860	2,262,784	2,228,588	1,427,923
Imports for consumption	17,434	13,164	8,104	459	1,172
Exports, domestic	3,758	3,500	3,480	2,735	1,601
Consumption[3]	2,137,129	2,440,121	2,445,581	2,476,712	1,351,551
Superphosphate:					
Production[3]	3,699,579	4,487,683	4,342,012	4,595,096	2,744,528
Sales[3 4]	1,915,913	1,308,660	1,430,700	1,455,259	1,030,665
Exports	118,168	99,247	95,332	125,058	91,377
Potash:					
Production	76,810	104,129	107,820	105,810	133,920
Sales	94,722	105,208	101,370	96,290	133,430
Exports	----------	----------	15,532	17,042	32,460
Imports (general)[5] from—					
Spain	9,281	11,339	21,596	25,811	20,897
Germany	451,734	617,434	543,072	567,382	306,028
Netherlands[6]	11,650	21,178	12,804	29,420	133,577
France	44,273	3,974	----------	----------	3,720
Belgium[7]	168,429	276,158	292,462	300,417	54,116
Other countries	1,983	1,533	548	1,295	1,455
Total	687,350	931,616	870,502	933,325	528,793
Imports for consumption—					
Kainit	115,345	119,897	85,042	125,455	61,750
Manure salts	311,357	453,242	437,727	405,215	200,600
Muriate of potash	183,475	261,644	258,682	306,047	202,204
Sulphate of potash	77,172	96,833	89,051	90,608	63,663
Other potash-bearing substances	10,531	12,076	706	613	547
Total	697,880	943,692	871,208	933,938	528,764

Bureau of Agricultural Economics. Compiled as follows: Production and sales, sulphate of ammonia and potash from Bureau of Mines. Sulphuric acid and superphosphate from Bureau of the Census. Imports and exports from Bureau of Foreign and Domestic Commerce.

[1] Preliminary.
[2] By-product of coke ovens; production from other sources (coal, gas, bone carbonizing, etc.) is usually less than 5 per cent of the total production.
[3] Fertilizer establishments only.
[4] Bulk superphosphate. Superphosphate in base and mixed goods excluded.
[5] Includes kainit, manure salts, sulphate of and muriate of potash.
[6] Originated mostly in Germany.
[7] Originated mostly in France.

TABLE 504.—*Nitrogen: World production of, contained in inorganic nitrogenous materials, 1928–1932*

Product	Quantity produced during year ended June 30—				
	1928	1929	1930	1931	1932
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*
By-product sulphate of ammonia	404,800	413,600	466,900	395,500	293,118
Other by-product ammonia[1]	59,400	56,100	56,500	34,000	34,287
Cyanamide	224,400	231,000	290,100	221,000	147,514
Synthetic sulphate of ammonia	403,700	533,500	486,300	384,000	571,032
Nitrate of lime	115,500	149,600	143,500	121,600	87,471
Other synthetic nitrogen[1]	259,600	401,500	470,000	432,500	388,652
Chilean nitrate of soda	429,000	539,000	510,000	275,000	187,000
Total	1,896,400	2,324,300	2,423,300	1,863,600	1,709,074

Bureau of Chemistry and Soils. British Sulphate of Ammonia Federation (Ltd.), annual report. Fertilizers are included in this table under the final form as sold, so that, for example, cyanamide if converted into sulphate of ammonia is included under synthetic sulphate of ammonia, or, if into ammophos, is included under other synthetic nitrogen.

[1] Including ammonia products used for industrial purposes and ammonia in mixed fertilizers.

TABLE 505.—*Insecticides and fungicides: Production, sales, imports for consumption and domestic exports, 1927–1931*

Item	1927	1928	1929	1930	1931
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Arsenic, white:					
Production [1]	23,460,000	28,362,000	33,210,000	34,114,000	34,274,000
Sales [2]—					
Refined	20,040,000	16,230,000	19,646,000	29,308,000	23,964,000
Crude	3,080,000	7,304,000	9,446,000	5,542,000	3,590,000
Imports for consumption	25,033,649	22,305,972	26,314,042	20,942,663	15,581,398
Calcium arsenate:					
Production	27,282,326	--------	33,064,426	--------	26,128,620
Imports for consumption	3,807	1,323	--------	6,359	40,950
Exports	--------	1,178,702	3,139,633	3,177,335	2,145,653
Lead arsenate:					
Production	21,527,838	--------	30,682,379	--------	37,974,038
Imports for consumption	--------	--------	200	800	--------
Exports	--------	1,093,673	1,563,982	2,270,980	1,788,345
Sulphate of copper:					
Production [3]	36,039,487	44,463,000	40,258,860	36,976,403	35,227,400
Imports for consumption	1,978,726	3,611,844	5,388,743	5,964,378	2,643,741
Exports	6,206,904	8,666,899	6,419,688	5,061,554	7,190,919
Tobacco extracts, exports [4]	2,297,016	2,386,526	2,294,567	1,929,171	1,497,679
Sodium arsenate:					
Imports for consumption	90,454	12,403	133,539	94,051	9,284
Prepared animal dips:					
Imports for consumption [5]	102,394	175,055	208,770	174,215	154,530
Exports	--------	--------	2,252,644	1,258,139	--------

Bureau of Agricultural Economics. Production and sales from Bureau of the Census and Bureau of Mines (indicated by footnote); imports and exports from the Bureau of Foreign and Domestic Commerce.

[1] By-product from the mining of copper, lead, and iron ores. (Bureau of Mines.) The Census of Manufactures gives production for 1927 as 35,315,999 pounds, and 1929 as 42,926,400 pounds.
[2] Sales by producers. (Bureau of Mines.)
[3] Copper industry only. (Bureau of Mines.) The total production as reported by the census for 1927 was 56,666,812 pounds; 1929 as 78,669,112 pounds; and 1931, 60,037,705 pounds.
[4] Nicotine sulphate and "other tobacco extracts."
[5] Classified as sheep dip.

TABLE 506.—*Insecticides and fungicides: Average wholesale price per pound at New York, 1923–1932* [1]

Calendar year	Arsenic, white	Calcium arsenate	Lead arsenate		Paris green	Bordeaux mixture		Lime-sulphur solution, per gallon
			Powder	Paste		Powder	Paste	
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	14.2	16.4	22.2	15.7	30.4	22.0	16.3	16.5
1924	9.4	10.6	20.9	13.1	28.8	16.3	12.5	16.5
1925	5.1	7.8	15.6	11.0	21.5	13.2	11.0	16.5
1926	3.8	8.0	14.6	11.0	18.4	11.5	11.0	14.7
1927	4.0	7.5	13.8	--------	19.2	11.5	11.0	15.5
1928	4.4	6.8	14.1	--------	27.0	11.3	10.9	15.5
1929	4.5	7.4	13.5	--------	30.9	11.3	10.7	15.2
1930	4.5	8.1	14.5	--------	35.2	13.0	13.0	15.2
1931	4.5	6.5	12.6	--------	32.5	12.8	12.8	15.2
1932	4.5	6.0	11.6	--------	30.1	12.8	12.8	16.3

Bureau of Agricultural Economics. Compiled from the Oil, Paint, and Drug Reporter.

[1] Average of monthly range.

TABLE 507.—*Number of marketing and purchasing associations, estimated membership, and estimated amount of business, by geographic divisions and States, 1931–1932*

Geographic division and State	Cotton and cotton products			Dairy products			Forage crops			Fruits and vegetables			Grain			Livestock			Nuts		
	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business	Listed[1]	Estimated membership	Estimated business
	Number	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*
United States	267	240,000	69,000	2,392	740,000	520,000	31	7,500	1,750	1,347	180,000	283,000	3,500	705,000	150,000	1,885	450,000	260,000	70	18,000	8,600
New England				56	35,500	53,760				32	1,340	3,070				2	140	180			
Maine				2	300	180				16	480	270									
New Hampshire				2	160	310				1	30	20				1	40	10			
Vermont				36	6,900	9,630				1	40	10									
Massachusetts				10	24,100	32,830				12	750	2,760				1	100	170			
Rhode Island				2	170	370															
Connecticut				4	3,870	10,440				2	40	10									
Middle Atlantic				68	106,400	137,800				78	11,960	13,790	4	950	800	4	3,000	2,900			
New York				38	65,400	99,140				55	6,870	7,000	2	100	200	2	1,000	2,200			
New Jersey										9	3,660	2,940									
Pennsylvania				30	41,000	38,660				14	1,430	3,850	2	850	600	2	2,000	700			
East North Central				1,063	205,700	142,890	2	2,920	236	124	13,840	13,790	915	222,080	117,600	701	200,000	95,300			
Ohio				29	31,900	19,110				15	1,930	5,170	193	55,380	26,000	63	35,000	15,000			
Indiana				31	18,000	5,470				5	550	200	119	40,200	16,000	74	31,000	12,000			
Illinois				74	32,800	35,460	2	2,920	236	26	1,850	750	453	79,300	56,000	313	78,000	50,000			
Michigan				75	45,000	25,170				54	6,550	4,800	98	32,800	14,700	80	23,000	6,800			
Wisconsin				854	78,000	57,680				24	2,960	2,870	52	14,400	4,900	171	33,000	11,500			
West North Central	4	100	10	1,008	309,300	112,890	5	1,160	445	105	12,850	7,300	2,191	409,370	262,630	1,067	203,500	137,700			
Minnesota				644	116,000	63,180				26	3,370	1,290	322	75,200	34,500	347	66,000	45,000			
Iowa				260	71,000	31,270				3	460	170	370	78,950	55,000	369	64,500	53,000			
Missouri	4	100	10	12	14,800	5,320	1	240	232	55	6,520	2,130	149	39,000	19,000	142	35,000	18,000			
North Dakota				23	4,000	870	1	160	73	6	620	260	407	52,400	27,100	80	11,000	2,400			
South Dakota				26	20,500	3,640	1	650	75	3	80	100	244	47,300	24,500	60	9,000	6,500			
Nebraska				35	73,000	6,940	1	60	65	7	1,500	2,600	355	58,560	46,600	39	10,000	10,000			
Kansas				6	10,000	1,070	1	50	10	5	300	750	344	57,960	55,930	30	8,000	2,800			

[1] Including federations, sales agencies, and subsidiaries.

163050°—33——49

TABLE 507.—*Number of marketing and purchasing associations, estimated membership, and estimated amount of business, by geographic divisions and States, 1931–1932*—Continued

Geographic division and State	Cotton and cotton products			Dairy products			Forage crops			Fruits and vegetables			Grain			Livestock			Nuts		
	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business	Listed	Estimated membership	Estimated business
	Number	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*
South Atlantic	39	34,100	5,330	28	12,730	16,180				200	23,880	41,320	6	1,210	1,050	34	8,000	1,020	12	3,120	795
Delaware										4	100	50									
Maryland				7	4,180	7,260				12	3,000	2,380	3	1,060	1,000	1	1,500				
District of Columbia				1	1,200	6,640															
Virginia				11	4,000	1,040				14	2,880	5,600	2	140	50	7	1,600	500	2	500	300
West Virginia				1	10	60				9	240	660				21	3,700	400			
North Carolina	13	14,000	2,250	7	3,300	930				13	1,140	420	1	10		1	100	20			
South Carolina	6	5,600	1,040							12	1,730	5,200							1	320	23
Georgia	20	14,500	2,040							13	4,580	1,160				3	1,000	90	9	2,300	472
Florida				1	40	230				123	10,210	25,850				1	100	10			
East South Central	23	81,500	31,900	23	7,380	2,780	4	1,540	156	92	12,900	4,530	4	900	70	25	14,760	5,020	7	2,860	441
Kentucky				4	3,000	1,090	2	1,120	146	16	3,980	1,100	2	800	50	8	3,800	4,000			
Tennessee	3	19,000	10,200	14	3,530	1,120	1	220		41	4,340	1,430	2	100	20	7	8,000	250			
Alabama	12	36,000	1,700	3	100	100				20	3,250	1,300				8	1,310	700	3	2,160	261
Mississippi	8	26,500	20,000	2	750	450	1	200	10	15	1,330	700				2	750	70	4	700	180
West South Central	192	121,600	30,460	18	7,500	1,520	3	200	10	136	17,700	11,660	105	30,660	25,200	16	4,500	3,270	14	780	84
Arkansas	5	600	20							75	7,920	1,570	4	300	900	8	1,000	170			
Louisiana	5	13,000	8,230							22	4,090	3,940	2	1,060	4,700				1	30	3
Oklahoma	99	52,000	6,500	12	5,000	1,170				10	440	500	82	23,100	12,700	4	1,500	200	4	320	20
Texas	83	56,000	15,710	6	2,500	350	3	200	10	29	5,250	5,650	17	6,200	6,900	4	2,000	2,900	9	430	61
Mountain	7	1,900	400	40	21,890	6,970	12	1,390	610	101	24,190	26,410	160	26,980	22,150	29	10,500	5,580			
Montana				7	2,400	500	2	190	94	7	2,590	2,040	69	10,280	7,500	15	4,000	640			
Idaho				12	12,100	4,750	5	790	13	15	2,090	2,240	25	4,870	4,400	2	1,000	200			
Wyoming				3	240	100				5	460	300	8	1,200	600	1	900	100			
Colorado				7	3,570	290	1	10		48	11,810	15,700	45	9,800	9,000	10	4,000	4,600			
New Mexico	5	1,300	300	2	670	190	2	260	288	4	210	320	5	300	100						

Arizona	2	600	100	1	10	10	1	60	205	4	1,010	1,600				1	600	40			
Utah				8	2,000	1,130	1	80	10	16	6,000	4,200	7	500	500						
Nevada										2	20	10	1	30	50						
Pacific	2	800	900	88	33,600	45,250	5	290	203	479	61,340	161,130	115	12,850	20,500	7	5,600	9,030	37	11,240	7,280
Washington				25	14,400	12,100	1	100	28	68	9,780	16,130	67	7,590	10,000						
Oregon				39	9,200	6,310	2	50	12	62	7,870	11,000	26	2,360	4,300	2	1,100	550	6	1,140	502
California	2	800	900	24	10,000	26,840	2	140	253	349	43,690	134,000	22	2,900	6,200	5	4,500	8,480	31	10,100	6,778

Geographic division and State	Poultry and poultry products			Tobacco			Wool and mohair			Miscellaneous selling			Miscellaneous buying			Total		
	Listed [1]	Estimated membership	Estimated business	Listed [1]	Estimated membership	Estimated business	Listed [1]	Estimated membership	Estimated business	Listed [1]	Estimated membership	Estimated business	Listed [1]	Estimated membership	Estimated business	Listed [1]	Estimated membership	Estimated business
	Number	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*
United States	172	88,000	72,000	21	54,000	10,000	134	62,000	21,000	436	122,500	48,650	1,645	533,000	181,000	11,900	3,200,000	1,925,000
New England	5	630	1,350				4	490	18	14	1,340	550	90	45,900	18,180	203	85,340	77,108
Maine							1	430	17	2	100	60	27	5,000	2,220	48	6,370	2,747
New Hampshire													9	2,300	2,280	13	2,530	2,020
Vermont										9	1,000	470	1	200	80	47	8,140	10,140
Massachusetts	1	20	350				3	60	1	2	70	10	18	36,000	11,870	47	61,100	47,991
Rhode Island										1	110	10	2	100	80	5	380	400
Connecticut	4	610	1,000										33	2,300	1,700	43	6,820	13,150
Middle Atlantic	16	1,450	2,760	3	200	30	43	2,850	140	24	2,780	970	242	77,600	44,610	482	207,190	203,800
New York	6	150	2,260				20	550	40	7	500	160	128	57,000	36,010	258	131,570	147,010
New Jersey	9	1,160	400							8	850	250	28	8,600	4,310	54	14,270	7,900
Pennsylvania	1	140	100	3	200	30	23	2,300	100	9	1,430	560	86	12,000	4,290	170	61,350	48,890
East North Central	10	3,070	1,250	4	7,300	2,070	6	12,450	1,073	100	26,570	11,450	351	128,000	36,600	3,276	821,930	422,259
Ohio	1	90	90	1	200	60	1	8,150	755	6	1,420	540	45	15,000	5,970	354	149,070	72,695
Indiana	4	1,500	620	1	100	10	2	2,060	125	11	2,650	1,500	68	28,000	8,170	315	124,060	44,095
Illinois	3	680	330							13	7,100	2,510	70	40,000	6,660	954	242,850	151,946
Michigan	1	500	180				1	1,000	128	42	9,150	4,480	42	15,000	5,100	393	133,000	61,358
Wisconsin	1	100	30	2	7,000	2,000	2	1,240	65	28	6,250	2,420	126	30,000	10,700	1,260	172,950	92,165

[1] Including federations, sale agencies, and subsidiaries.

TABLE 507.—*Number of marketing and purchasing associations, estimated membership, and estimated amount of business, by geographic divisions and States, 1931–1932*—Continued

Geographic division and State	Poultry and poultry products: Listed	Poultry and poultry products: Estimated membership	Poultry and poultry products: Estimated business	Tobacco: Listed	Tobacco: Estimated membership	Tobacco: Estimated business	Wool and mohair: Listed	Wool and mohair: Estimated membership	Wool and mohair: Estimated business	Miscellaneous selling: Listed	Miscellaneous selling: Estimated membership	Miscellaneous selling: Estimated business	Miscellaneous buying: Listed	Miscellaneous buying: Estimated membership	Miscellaneous buying: Estimated business	Total: Listed	Total: Estimated membership	Total: Estimated business
	Number	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*	*Number*	*Number*	*1,000 dolls.*
West North Central	26	31,790	11,560	1	100	10	12	24,420	2,651	140	34,660	13,090	679	192,000	47,210	5,238	1,219,250	595,406
Minnesota	2	20	100				5	5,350	270	9	2,500	830	184	60,000	9,990	1,539	328,440	155,160
Iowa	2	600	100				2	5,170	347	7	800	1,200	137	50,000	9,030	1,150	271,480	150,177
Missouri	16	28,500	11,000	1	100	10	3	8,200	917	106	27,730	8,920	134	28,000	14,170	623	188,100	79,709
North Dakota							1	2,900	600	3	230	20	24	4,000	1,180	545	75,310	32,503
South Dakota	2	1,000	160				1	2,800	517	3	1,100	850	36	10,000	1,720	376	92,430	38,062
Nebraska	4	1,670	200							3	700	180	89	28,000	6,840	533	173,490	73,415
Kansas										9	1,600	1,030	75	12,000	4,280	472	89,910	66,470
South Atlantic	23	2,330	730	5	23,400	4,910	7	2,020	84	40	19,890	12,370	85	24,100	10,780	479	154,780	94,549
Delaware																4	100	50
Maryland				1	5,500	4,400	3	430	27	1	110	150	19	3,800	2,000	47	19,580	17,217
District of Columbia																1	1,200	6,640
Virginia	1	20	20	2	12,600		1	100	7	6	1,600	280	33	15,000	7,640	79	38,440	15,437
West Virginia	2	460	110				3	1,490	50	3	9,830	6,600	7	2,200	350	46	17,930	8,230
North Carolina	9	640	240	1	800	500				21	5,200	2,860	14	2,000	370	80	27,190	7,590
South Carolina				1	4,500	10							1	100	10	21	12,250	6,283
Georgia	6	680	30							5	2,000	360	5	400	120	61	25,460	4,272
Florida	5	530	830							4	1,150	2,120	6	600	290	140	12,630	28,830
East South Central	10	1,970	350	8	23,000	2,980	20	3,290	212	63	19,420	4,360	32	24,500	5,570	311	194,020	58,349
Kentucky	2	180	20	6	12,000	1,380	7	1,440	95	1	10	10	8	4,000	300	56	30,330	8,191
Tennessee	1	20		2	11,000	1,600	11	1,740	97	17	2,110	680	9	5,500	400	108	56,460	15,797
Alabama	4	1,360	240				2	110	20	23	4,800	1,980	9	9,000	2,700	84	58,090	9,001
Mississippi	3	410	90							22	12,500	1,690	6	6,000	2,170	63	49,140	25,360

West South Central	25	1,400	1,430				7	3,190	5,032	23	11,260	3,600	62	18,000	5,030	601	216,790	87,356
Arkansas	2	20					1	70	2	4	1,000	280	9	1,000	440	108	11,910	3,382
Louisiana	5	230	10							5	3,200	900	2	8,000	1,030	42	29,670	18,813
Oklahoma	6	670	420							4	5,530	1,730	21	3,000	1,350	242	91,560	24,590
Texas	12	480	1,000				6	3,120	5,030	10	1,470	750	30	6,000	2,210	209	83,660	40,571
Mountain	35	16,120	9,550				32	9,590	8,730	23	4,730	2,090	51	10,900	3,300	490	128,190	85,790
Montana	15	2,690	220				11	3,520	1,800	2	160	70	17	2,600	700	145	28,430	13,564
Idaho	4	5,910	900				6	1,100	1,000	3	1,100	210	6	1,900	460	78	28,860	14,163
Wyoming	4	440	80				4	1,070	1,100	2	1,160	540	6	1,200	380	33	6,670	3,200
Colorado	5	1,660	330				4	1,400	1,400	6	140	370	12	4,000	1,420	138	36,390	33,110
New Mexico	1	10					1	600	940	3	100	10	2	600	220	25	4,050	2,368
Arizona	1	10	10				1	80	390	4	770	680	2	200	30	17	3,340	3,065
Utah	2	7,000	7,760				4	1,700	1,600	3	1,300	210	5	400	100	46	19,880	15,510
Nevada	3	400	250				1	120	500				1			8	570	610
Pacific	22	29,240	43,020				3	3,700	3,060	9	1,850	110	53	12,000	9,720	820	172,510	300,293
Washington	5	15,470	16,000				1	50	570	3	50	10	29	6,000	2,510	199	53,440	57,348
Oregon	6	3,410	2,140				1	3,400	1,760	4	1,450	10	9	1,500	830	157	31,480	27,414
California	11	10,360	24,680				1	250	730	2	350	90	15	4,500	6,390	464	87,590	215,531

Federal Farm Board.

TABLE 508.—*Associations marketing dairy products: Number listed and estimated business, 1925–26 to 1928–1931*

Year	Creamery associations		Cheese-making associations		Milk-distributing associations		Milk-bargaining associations		Miscellaneous associations		Total associations	
	Listed	Estimated business	Listed	Estimated business	Listed	Estimated business	Listed	Estimated business	Listed [1]	Estimated business [2]	Listed	Estimated business
	Number	*1,000 dollars*	*Number*	*1,000 dollars*	*Number*	*1,000 dollars*	*Number*	*1,000 dollars*	*Number*	*1,000 dollars*	*Number*	*1,000 dollars*
1925	1,400	222,000	600	25,000	[3] 140	160,000	40	125,000	17	3,000	2,197	535,000
1926	1,390	230,000	751	32,000	119	135,000	40	192,000	179	11,000	2,479	600,000
1928	1,400	245,000	740	30,000	114	150,000	47	200,000	199	15,000	2,500	640,000
1929	1,385	264,804	717	27,931	111	138,694	50	229,251	195	19,320	2,458	680,000
1930	1,366	219,870	731	21,790	101	142,130	50	227,460	187	28,750	2,435	640,000
1931	1,379	175,290	712	15,680	109	112,090	59	206,460	133	10,480	2,392	520,000
LEADING STATES, 1931												
New York	3	130	20	470	10	68,070	2	30,350	3	120	38	99,140
Minnesota	607	54,110	24	580	4	8,000			9	490	644	63,180
Wisconsin	234	30,070	592	11,590	9	3,440	5	10,950	14	1,630	854	57,680
Pennsylvania	15	730	3	50	9	1,290	2	36,560	1	30	30	38,660
Illinois	9	880	29	410	5	1,710	7	31,920	24	540	74	35,460
Massachusetts	1	10			8	4,320	1	28,500			10	32,830
Iowa	251	29,100			2	700	6	1,470	1		260	31,270
California	15	15,520			4	210	4	11,110	1		24	26,840
Michigan	59	8,420	5	170	7	2,560	2	13,770	2	250	75	25,170
Ohio	6	1,240	2	30	8	8,480	7	8,800	6	560	29	19,110
All others	*179*	*35,080*	*37*	*2,380*	*43*	*13,310*	*23*	*33,030*	*69*	*6,860*	*354*	*90,660*

Federal Farm Board.

[1] Including federations, sales agencies, warehouse associations, associations manufacturing ice cream, milk powder, etc.
[2] Not including amounts reported by federations, sales agencies, etc.
[3] *Including associations marketing cream. In subsequent years these were included among the miscellaneous associations.*

TABLE 509.—*Wheat received by large-scale pooling associations, by crops, 1921–1930*[1]

Association	Address	Year organized	Crop of— 1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
			Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Colorado Wheat Growers' Association	Denver, Colo.	1922	----------	87,795	1,301,666	1,191,500	[2] 584,478	[2] 400,000	(3)	(3)	(3)	[2] 1,800,000
Idaho Wheat Growers' Association	Lewiston, Idaho	1920	[4] 2,188,870	[5] 424,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Indiana Wheat Growers' Association [6]	Indianapolis, Ind.	1924	----------	----------	----------	1,524,250	3,157,952	4,177,453	2,206,652	40,000	400,000	2,395,726
Kansas Wheat Growers' Association	Wichita, Kans.	1921	} (7)									
Kansas Cooperative Wheat Marketing Association.	do	1924		2,335,751	2,052,800	6,138,112	[2] 2,631,758	[2] 4,056,243	[2] 2,465,423	[2] 4,692,517	[2] 3,381,135	[2] 7,971,489
Minnesota Wheat Growers' Cooperative Marketing Association.	Minneapolis, Minn.	1923	----------	----------	523,644	1,713,136	1,341,958	799,183	568,790	587,294	381,895	63,700
Montana Wheat Growers' Association	Lewistown, Mont.	1921	----------	6,048,000	4,390,000	1,551,059	(3)	(3)	(3)	(3)	(3)	(3)
Nebraska Wheat Growers' Association [8]	Hastings, Nebr.	1922	----------	396,860	550,000	1,202,556	[2] 662,421	[2] 818,292	[2] 587,524	(3)	762,553	[9] 328,000
North Dakota Wheat Growers' Association.[10]	Grand Forks, N. Dak.	1922	----------	2,981,763	2,067,864	3,887,881	3,202,500	1,300,000	2,420,169	3,161,805	4,545,000	2,229,479
Oklahoma Wheat Growers' Association	Enid, Okla.	1921	----------	[11] 2,961,074	[11] 4,560,787	[11] 6,281,067	[11] 2,800,675	[2] 2,436,899	1,448,591	[12] 4,426,919	4,995,074	4,682,731
Oregon Cooperative Grain Growers	Portland, Oreg.	1921	[5] 3,725,436	[5] 2,364,063	[5] 3,426,616	(3)	(3)	(3)	(3)	(3)	(3)	(3)
South Dakota Wheat Growers' Association.[13]	Aberdeen, S. Dak.	1923	----------	----------	534,227	2,048,475	2,100,000	123,210	2,085,257	1,197,000	901,491	294,165
Texas Wheat Growers' Association	Amarillo, Tex.	1922	----------	[11] 218,520	[11] 1,210,489	[11] 2,429,208	[11] 341,818	3,384,446	553,731	745,000	[14] 2,206,389	[14] 4,421,684
Washington Wheat Growers' Association[15]	Spokane, Wash.	1920	[5] 5,458,463	[5] 2,475,784	[5] 3,828,528	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Total			11,372,768	20,293,610	24,446,621	27,967,244	16,823,560	17,494,726	12,336,137	14,350,535	17,573,537	24,206,974

Federal Farm Board.

[1] As reported by pool managements.
[2] Marketed through Southwest Cooperative Wheat Growers' Association, Kansas City, Mo.
[3] Not operating.
[4] Includes 1,270,991 bushels for 10 northern counties of Idaho, marketed through Washington Wheat Growers' Association and 917,879 bushels for southern counties marketed as a separate pool.
[5] Marketed through Northwest Wheat Growers' Associated, Portland, Oreg., and subsequently Minneapolis, Minn.
[6] Name changed in 1926 to Central States Soft Wheat Growers' Association, and in 1929 to Central States Grain Association (Inc.).
[7] Crops of 1922 and 1923 delivered to Kansas Wheat Growers' Association; crops of 1924 and 1925 delivered to Kansas Wheat Growers' Association and Kansas Cooperative Wheat Marketing Association. Crops for 1926 and subsequent years delivered to latter organization and marketed through Southwest Cooperative Wheat Growers' Association, Kansas City, Mo.
[8] Superseded in 1929 by Midwest Grain Marketing Association Nonstock Cooperative, Lincoln, Nebr., and subsequently Omaha, Nebr.
[9] Marketed through Farmers' Westcentral Grain Co., Omaha, Nebr.
[10] Name changed in 1929 to North Dakota-Montana Wheat Growers' Association.
[11] Marketed through Southwest Wheat Growers' Associated, Enid, Okla.
[12] In addition to the above, wheat was handled by the Oklahoma Wheat Pool Elevator Corporation, a subsidiary of the Oklahoma Wheat Growers' Association.
[13] Since about 1924 the grain received has been marketed through a subsidiary, the American Wheat Growers' Associated (Inc.), Minneapolis, Minn., now Aberdeen, S. Dak.
[14] Marketed through the Oklahoma Wheat Growers' Association, Enid, Okla.
[15] Handled on a voluntary basis 1,500,000 bushels of wheat of the 1920 crop.

TABLE 510.—*Cooperative citrus-fruit shipments and such shipments a a percentage of production for specified areas, 1920–21 to 1930–31*

[Revised to June 1, 1932]

Marketing season	Packed boxes handled by associations in—							
	California and Arizona		Florida and Alabama		Texas		United States	
	Boxes	Per cent[1]	Boxes	Per cent[1]	Boxes	Per cent[1]	Boxes	Per cent[1]
1920–21	21, 806, 253	81. 8	3, 905, 841	27. 9			25, 712, 094	63. 2
1921–22	12, 847, 455	74. 8	3, 908, 395	27. 6			16, 755, 850	53. 3
1922–23	19, 810, 048	82. 5	5, 443, 758	30. 3			25, 253, 806	59. 9
1923–24	21, 671, 344	69. 1	5, 548, 241	25. 8	26, 570	37. 4	27, 246, 155	51. 3
1924–25	17, 635, 860	74. 3	6, 375, 759	31. 5	65, 690	29. 5	24, 077, 309	54. 4
1925–26	23, 011, 773	71. 3	4, 193, 316	25. 4	38, 624	18. 4	27, 243, 713	55. 4
1926–27	25, 427, 062	69. 3	4, 860, 948	26. 2	95, 053	26. 4	30, 383, 063	54. 4
1927–28	21, 810, 826	72. 8	3, 876, 577	25. 0	124, 115	23. 9	[2] 25, 843, 253	55. 9
1928–29	32, 129, 643	67. 1	7, 290, 156	28. 5	262, 459	31. 2	[2] 39, 716, 747	53. 3
1929–30	22, 930, 811	72. 1	5, 549, 105	32. 2	453, 043	25. 3	[2] 28, 967, 192	56. 8
1930–31	31, 880, 555	71. 3	10, 277, 883	20. 4	363, 430	28. 8	[2] 42, 584, 511	52. 4

Federal Farm Board.

[1] Per cent of production for the specified area, Yearbook of Agriculture, 1932, p. 706.
[2] Including an association in Louisiana.

TABLE 511.—*Livestock handled, sales, and purchases, by terminal-market cooperative sales agencies, 1918–1931*

Calendar year	Animals received[1]					Animals purchased	
	Associations reporting	Cattle and calves	Hogs	Sheep	Total[2]	Associations reporting	Number
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	
1918	3	30, 528	139, 483	7, 548	189, 283	1	252
1919	4	63, 876	381, 127	23, 940	563, 383	2	8, 504
1920	4	85, 313	536, 380	29, 676	748, 255	2	6, 550
1921	6	163, 361	912, 095	103, 101	1, 310, 628	3	42, 032
1922	16	736, 982	3, 414, 016	352, 861	4, 727, 056	4	86, 350
1923	23	1, 409, 322	7, 732, 437	733, 552	9, 933, 445	8	103, 928
1924	26	1, 893, 326	9, 239, 070	1, 202, 616	11, 382, 304	14	242, 039
1925	28	1, 681, 241	7, 377, 084	1, 350, 311	10, 666, 069	16	288, 150
1926	27	2, 003, 014	6, 687, 296	1, 581, 882	10, 333, 307	18	328, 016
1927	28	1, 678, 094	7, 149, 561	1, 598, 465	10, 426, 120	21	280, 808
1928	28	1, 751, 599	8, 483, 413	1, 686, 889	11, 921, 901	18	325, 267
1929	28	1, 904, 066	8, 054, 184	2, 093, 136	12, 051, 386	20	[3] 577, 646
1930	30	2, 088, 411	7, 259, 731	2, 609, 604	11, 957, 746	22	723, 422
1931	34	2, 216, 507	7, 169, 955	3, 028, 503	12, 414, 965	23	633, 855

Calendar year	Total animals handled		Value of sales[4]	Value of purchases	Value of business handled	
	Associations reporting	Number[2]			Associations reporting	Total[5]
	Number		*Dollars*	*Dollars*	*Number*	*Dollars*
1918	3	189, 535	12, 384, 348	15, 901	4	12, 400, 249
1919	4	571, 887	35, 178, 255	622, 335	6	35, 800, 590
1920	4	754, 805	37, 419, 935	458, 824	6	37, 878, 759
1921	6	1, 352, 660	35, 309, 401	894, 972	6	36, 204, 373
1922	16	4, 813, 406	101, 818, 588	3, 069, 638	18	104, 888, 226
1923	23	10, 037, 373	191, 954, 106	4, 631, 630	23	196, 904, 508
1924	26	11, 624, 343	231, 372, 776	5, 222, 121	24	236, 594, 897
1925	28	10, 954, 219	271, 797, 282	7, 923, 372	24	279, 720, 654
1926	27	10, 661, 323	278, 900, 462	8, 249, 106	24	293, 249, 470
1927	28	10, 793, 681	145, 202, 942	3, 036, 904	28	274, 209, 285
1928	28	12, 339, 000	279, 674, 261	8, 741, 163	28	289, 132, 931
1929	28	[3] 12, 755, 647	302, 894, 934	[3] 11, 627, 701	28	314, 522, 635
1930	30	12, 857, 965	263, 679, 996	10, 008, 169	30	273, 688, 165
1931	34	[6] 13, 306, 743	183, 288, 867	6, 915, 387	34	[6] 190, 769, 836

Federal Farm Board.

[1] Includes some animals sold for yard traders.
[2] Includes animals not segregated by kind.
[3] Includes 114,757 sheep, valued at $906,040 from producers to feeders.
[4] Includes sales for yard traders.
[5] Includes business not classified as sales or purchases.
[6] Includes animals handled in the country.

TABLE 512.—*Freight tonnage originating on railways in the United States, 1925–1931* [1]

Commodity	Calendar year						
	1925	1926	1927	1928	1929	1930	1931 [2]
FARM PRODUCTS							
Animals and animal products:	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Animals, live—							
Horses and mules	544	513	541	577	553	440	316
Cattle and calves	9,330	9,241	8,636	7,976	7,310	6,785	6,097
Sheep and goats	1,224	1,270	1,298	1,362	1,387	1,385	1,343
Hogs	5,502	5,271	5,369	5,871	5,534	4,902	4,501
Packing-house products—							
Fresh meats	2,904	2,906	2,986	2,935	3,007	2,928	2,933
Hides and leather	1,026	984	1,010	914	913	847	782
Other packing-house products	2,140	2,023	1,957	1,461	1,414	1,165	1,140
Total	6,070	6,003	5,953	5,310	5,334	4,940	4,855
Eggs	591	644	651	635	588	612	582
Butter and cheese	686	725	747	754	703	807	768
Poultry	357	408	407	407	418	419	416
Wool	263	281	356	394	414	354	388
Other animals and products	1,758	1,888	2,054	2,348	2,576	2,485	2,366
Total animals and animal products	26,325	26,244	26,010	25,634	24,907	23,129	21,632
Vegetable products:							
Cotton	4,127	4,482	4,182	3,772	3,940	3,032	2,432
Fruits and vegetables	*11,634*	*12,223*	*12,029*	*12,947*	*12,875*	*12,589*	*11,906*
Potatoes	4,614	4,339	4,728	4,511	4,425	4,332	4,114
Grain and grain products—							
Grain—							
Wheat	21,548	24,379	26,237	26,950	27,019	25,466	26,228
Corn	12,680	13,924	13,162	17,045	15,258	13,986	10,728
Oats	8,450	6,496	5,518	5,888	5,713	5,184	3,970
Other grain	4,564	4,014	5,216	5,506	4,477	4,045	2,924
Grain products—							
Flour and meal	9,901	10,137	10,027	10,754	10,627	10,546	10,067
Other mill products	9,578	9,768	10,179	10,580	10,821	10,610	8,783
Total	*66,721*	*68,718*	*70,339*	*76,723*	*73,915*	*69,837*	*62,700*
Hay, straw, and alfalfa	5,506	5,028	4,468	3,909	3,697	3,494	2,174
Sugar, sirup, glucose, and molasses	5,700	5,744	5,584	5,604	5,858	5,659	5,142
Tobacco	1,038	1,010	1,053	945	989	1,008	816
Other vegetable products	17,118	17,609	18,469	16,686	15,502	16,436	13,346
Total vegetable products	116,458	119,153	120,852	125,187	121,201	116,387	102,630
Canned goods (food products)	4,144	4,070	4,204	4,805	5,029	4,751	3,954
Total farm products	146,927	149,467	151,066	155,626	151,137	144,267	128,216
OTHER FREIGHT							
Products of mines	678,336	758,064	713,731	696,583	737,879	642,537	501,903
Products of forests	107,391	104,859	99,391	96,737	94,855	69,360	43,024
Manufactures	274,001	284,640	279,407	300,043	319,177	267,353	198,270
Merchandise, all l. c. l. freight	40,587	39,498	38,432	36,954	36,043	29,667	22,773
Total tonnage	1,247,242	1,336,528	1,282,027	1,285,943	1,339,091	1,153,100	894,186

Bureau of Agricultural Economics. *Compiled from reports of the Interstate Commerce Commission.* Figures for earlier years appear in previous issues of the Yearbook.

[1] Weight as delivered at original shipping point. In the case of freight transported over several different railways, each ton is counted only when transported by the first railway. Some traffic, reshipped under new billing without benefit of transit privileges or proportional rates, may be counted more than once.

[2] Preliminary.

TABLE 513.—*Cooperative extension workers:*[1] *Number employed, United States, June 30, 1931 and 1932*

State or territory	County agricultural agents and assistants		County home demonstration agents and assistants		County club agents and assistants		Administrators and *supervisors*		Subject-matter *specialists*		*Total of all* agents	
	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932	1931	1932
Alabama	92	89	58	56			13	13	25	18	188	176
Alaska							3	3			3	3
Arizona	17	17	7	7			3	3	4	8	31	35
Arkansas	*78*	*68*	*68*	*58*			*15*	*15*	*18*	*15*	*179*	*156*
California	86	88	28	30			10	12	23	25	147	155
Colorado	33	31	11	10			5	5	14	14	63	60
Connecticut	10	10	8	8	13	13	5	5	25	25	61	61
Delaware	*3*	*3*	*3*	*3*	*3*	3	*3*	*3*	*5*	*6*	17	18
Florida	49	45	39	37			12	12	13	15	113	109
Georgia	121	130	96	93			16	18	38	27	271	268
Hawaii	5	4	5	5			3	3	3	4	16	16
Idaho	*26*	*24*	*7*	*6*	*2*	*2*	*6*	*6*	*20*	*16*	*61*	*54*
Illinois	110	110	32	32	4	4	13	14	31	29	190	189
Indiana	85	84	12	11	7	5	13	13	30	36	147	149
Iowa	*105*	*103*	*24*	*20*	*10*	*7*	*17*	*17*	*73*	*63*	*229*	*210*
Kansas	82	78	35	30	4	2	12	13	40	36	173	159
Kentucky	94	91	30	28			18	18	37	35	179	172
Louisiana	76	77	44	48			16	17	19	21	155	163
Maine	15	15	14	14	7	7	5	5	9	11	50	52
Maryland	31	31	26	26			6	6	35	31	98	94
Massachusetts	19	19	16	16	28	26	8	8	18	23	89	92
Michigan	66	66	8	6	14	11	17	16	60	50	165	149
Minnesota	71	65	17	16	26	19	13	14	33	27	160	141
Mississippi	89	93	73	69			19	20	18	21	199	203
Missouri	68	69	16	16			10	8	34	29	128	122
Montana	35	*31*	*14*	12			*5*	*5*	*19*	*13*	73	*61*
Nebraska	47	48	13	14	2		8	9	25	25	95	96
Nevada	11	12	5	5			3	3	3	3	22	23
New Hampshire	11	11	10	10	13	13	5	5	14	13	63	52
New Jersey	23	22	19	20	9	9	5	4	19	19	75	74
New Mexico	19	20	12	9			6	6	7	6	44	41
New York	83	80	55	49	44	46	12	12	71	88	265	275
North Carolina	104	*107*	63	66			*16*	*15*	24	21	207	*209*
North Dakota	32	31	6	6			6	6	19	17	63	60
Ohio	79	75	28	24	10	11	15	14	64	53	196	177
Oklahoma	93	83	66	66			16	18	26	19	201	186
Oregon	*34*	*35*	*7*	*7*	*8*	*8*	*7*	*7*	*20*	*15*	*76*	*72*
Pennsylvania	73	73	44	46			12	12	44	45	173	176
Puerto Rico									1	1	1	1
Rhode Island	3	3	3	3	3	3	3	3	5	9	17	21
South Carolina	64	64	55	54			14	15	29	25	162	158
South Dakota	32	24	14	13	5	4	5	7	17	16	73	64
Tennessee	92	87	53	43			18	14	24	25	182	169
Texas	219	202	146	136			26	26	21	26	412	390
Utah	22	22	*6*	*7*			*5*	5	14	13	47	47
Vermont	13	12	10	12	11	11	4	5	9	11	47	51
Virginia	106	98	53	49			18	17	36	37	213	201
Washington	36	39	12	11	5	5	3	3	10	11	66	69
West Virginia	44	46	25	26	15	6	11	9	19	20	114	107
Wisconsin	55	52	4	5	8	6	12	13	43	51	122	127
Wyoming	22	21	10	10			4	4	14	11	50	46
Total	2,783	2,708	1,410	1,348	251	221	495	504	1,222	1,178	6,161	5,959

Extension Service.

[1] *Includes both white and negro extension workers.*

TABLE 514.—*Cooperative extension work: Projects and percentage of agents' and specialists'*[1] *time devoted to each, 1925–1931*

Project	1925	1926	1927	1928	1929	1930	1931
Soils	5.2	5.3	4.8	5.1	5.1		
Farm crops	13.1	13.1	12.4	11.5	11.0	15.2	13.8
Horticulture	6.9	7.3	7.1	7.3	7.0	8.7	9.4
Forestry	.5	.7	.9	1.0	1.0	.9	.9
Animal husbandry	7.1	7.5	8.2	7.8	7.6	6.5	6.7
Dairy husbandry	7.0	7.1	7.9	8.7	8.6	7.7	6.7
Poultry husbandry	8.7	9.0	8.8	8.1	7.9	7.6	6.8
Rural engineering	3.7	3.6	3.4	3.3	3.2	3.3	3.1
Rodents and insects	2.0	1.7	1.5	1.3	1.1	1.3	1.4
Agricultural economics	3.0	4.0	4.1	4.0	4.3	6.2	6.8
Foods and nutrition	7.1	7.2	7.1	7.0	7.5	7.0	7.1
Child care and training						.6	.6
Clothing	7.9	7.1	6.8	6.8	6.9	6.7	6.6
Home management	1.7	1.5	1.5	1.7	2.2	2.1	2.0
House furnishings	1.2	1.8	2.0	2.4	2.6	2.6	2.7
Home health and sanitation	1.2	1.2	1.2	1.2	1.2	1.3	1.2
Community activities	6.2	5.9	6.0	6.8	5.9	4.0	5.3
Miscellaneous	16.6	16.0	16.3	17.0	16.3	7.5	8.0
Building extension program						3.7	3.7
Organization						7.1	7.2

Extension Service.

[1] Only field work of specialists as reported by county extension agents is included.

TABLE 515.—*Extension activities and accomplishments, as reported by all county extension agents, 1926–1931*

Activity or accomplishment relating to extension	1926	1927	1928	1929	1930	1931
	Number	*Number*	*Number*	*Number*	*Number*	*Number*
Farm visits made	1,388,459	1,439,503	1,506,510	1,633,154	1,758,743	1,822,272
Home visits made	387,724	396,093	432,433	489,294	546,208	602,885
Office calls received	3,340,242	3,600,448	3,687,570	3,991,725	4,317,565	5,156,854
Telephone calls received	2,333,286	2,476,672	2,556,899	2,710,723	3,015,707	3,063,569
News articles or stories published		334,271	371,331	423,600	449,854	490,507
Individual letters written	4,015,126	4,208,801	4,510,657	4,712,940	4,501,988	4,551,924
Different circular letters prepared					214,561	274,422
Bulletins distributed		5,120,768	5,608,604	6,345,488	6,657,561	8,203,294
Radio talks made					4,148	5,539
Events at which exhibits were shown	8,938	8,983	8,999	9,826	20,476	19,663
Training meetings held for local leaders	29,109	38,064	42,902	41,604	42,903	52,510
Method demonstration meetings held	387,051	398,051	437,993	486,398	402,458	461,793
Meetings at result demonstrations					66,368	70,098
Tours conducted					8,772	9,851
Achievement days held					14,720	15,450
Encampments held	2,716	3,145	2,781	2,921	3,762	3,685
All meetings held	599,797	636,588	683,305	771,321	750,379	851,197
Attendance at all meetings held	19,735,616	21,421,375	21,951,317	24,878,236	25,605,485	30,287,348
Result demonstrations conducted	644,784	772,185	851,526	929,744	934,182	1,090,011
Voluntary local leaders assisting with—						
Adult extension	173,122	183,065	179,559	201,882	233,043	278,633
Junior extension	48,899	60,182	58,258	71,636	85,344	98,304
Adult home demonstration groups					34,959	38,358
Members of such groups					646,340	760,171

Extension Service.

TABLE 516.—*4-H club work: Number of clubs, enrollment, projects completed, etc., 1926–1931*

Item	1926	1927	1928	1929	1930	1931
Junior clubs	41, 234	44, 188	46, 671	52, 180	56, 180	60, 781
Different boys enrolled	234, 078	249, 553	270, 534	303, 509	333, 197	360, 653
Different girls enrolled	352, 078	370, 159	393, 406	452, 587	489, 517	529, 721
Total	586, 156	619, 712	663, 940	756, 096	822, 714	890, 374
Different boys completing	145, 202	153, 324	175, 069	201, 910	222, 472	252, 328
Different girls completing	223, 103	245, 783	272, 510	305, 577	331, 873	376, 915
Total	368, 305	399, 107	447, 579	507, 487	554, 345	629, 243
Projects started	1, 161, 024	1, 330, 239	1, 466, 584	1, 614, 149	1, 535, 619	1, 693, 866
Projects completed (total)[1]	673, 997	776, 029	882, 795	905, 262	971, 308	1, 114, 065
Cereals	24, 107	25, 789	26, 997	29, 197	35, 380	44, 595
Legumes and forage	4, 988	5, 253	6, 137	7, 559	7, 902	10, 582
Potatoes, cotton, and other special crops	30, 458	25, 228	36, 475	40, 380	45, 010	45, 883
Horticulture	81, 494	88, 922	112, 296	124, 459	123, 751	156, 392
Forestry	730	2, 192	2, 719	3, 852	5, 379	7, 877
Rural engineering					6, 701	7, 168
Dairy	19, 094	23, 076	29, 468	37, 218	36, 554	38, 862
Animal husbandry	37, 409	44, 341	48, 233	54, 227	57, 790	68, 547
Poultry	52, 730	56, 756	56, 900	60, 020	61, 519	62, 058
Agricultural economics	6, 139	4, 925	8, 361	7, 379	6, 448	6, 558
Foods	131, 121	142, 302	167, 058	182, 877	193, 242	226, 390
Nutrition	39, 071	54, 451	62, 790	65, 652		
Child training and care					4, 508	5, 360
Clothing	133, 501	146, 181	162, 291	190, 249	209, 656	231, 749
Home management	10, 215	13, 822	16, 309	16, 237	17, 472	21, 000
House furnishings	24, 834	30, 024	36, 274	40, 999	49, 571	52, 753
Home health and sanitation	40, 857	56, 352	59, 342	77, 932	67, 810	79, 812
Miscellaneous	37, 249	56, 415	51, 145	57, 025	42, 615	48, 479

Extension Service.

[1] Boys' and girls' club members completing.

TABLE 517.—*Imports and price per pound of raw silk and production, imports and price per pound of rayon yarn, United States, 1923–1932*

Calendar year	Raw silk		Rayon yarn			
	Net imports [1]	Average price [2]	Production	Net imports [3]	Average price [4]: 150 A denier	Average price [4]: 300 A denier
	1,000 pounds	*Dollars*	*1,000 pounds*	*1,000 pounds*	*Dollars*	*Dollars*
1923	61, 511	8. 228	36, 477	6, 515	2. 800	2. 650
1924	59, 626	5. 917	38, 494	6, 569	2. 113	1. 871
1925	76, 003	6. 341	51, 902	12, 363	2. 004	1. 754
1926	76, 870	5. 937	63, 648	13, 918	1. 810	1. 603
1927	85, 036	5. 100	75, 555	17, 740	1. 489	1. 289
1928	87, 172	4. 859	97, 901	15, 113	1. 500	1. 300
1929	96, 848	[5] 4. 777	122, 000	20, 318	1. 246	1. 073
1930	80, 581	[5] 3. 173	110, 000	6, 009	1. 059	. 900
1931	87, 540	[5] 2. 233	144, 350	3, 460	. 758	. 636
1932 [6]	74, 841	[5] 1. 473	131, 000	2, 500	. 660	. 538

Bureau of Agricultural Economics. Compiled from annual issues of Commerce and Navigation of United States Department of Commerce, except production of rayon yarn which is from Yearbook of the Department of Commerce. Prices are from bulletins of the U. S. Bureau of Labor Statistics.

[1] Net imports are imports minus reexports.

[2] Average of monthly average prices of Japanese Kansai, No. 1.

[3] Net imports are imports minus reexports 1923–24. Subsequent years are imports minus exports and reexports.

[4] Average of monthly average prices. The count indicates the number of deniers or one-half decigram units, in weight, of a standard length of 450 meters. Since the standard is based on an arbitrary fixed length and a variable weight, the finer the yarn the smaller the count; 150 denier count, a size commonly used, is fine and 300 denier count is coarse.

[5] Average of monthly average prices of Japanese Best, No. 1 x 13–15.

[6] Preliminary.

INDEX

Page

Abaca, imports, 1909–1932 673
Agricultural—
by-products—
and wastes, *utilization studies* 364
utilization 39–43, 173–174
exports, index numbers, 1909–1932 669
products—
demand, 1923–1932. Wells A. Sherman, G. Burmeister, and A. C. Edwards 319–325
foreign trade 667–696
frozen-pack, success 346, 349
quality improvement by department 45–50
selected, exports 670–671, 674–681
selected, imports, 1909–1932 .... 672–673, 682–689
statistics 399–776
statistics, miscellaneous 740–776
Agriculture—
and the world crisis. L. H. Bean 91–95
report for year, by Secretary Hyde 1–89
Agriculture, Department of—
appropriations and economies, 1933 21
expenditures and income, discussion by Secretary 12–21
Alfalfa—
bacterial wilt, symptoms and control 212–213
losses from bacterial wilt, and need for resistant varieties. H. L. Westover 212–216
meal, prices, 1923–1932 577
seed, prices, farm, 1923–1932 586
varieties—
development, cooperative work of department 29
resistant to bacterial wilt 214–215
weevil, losses, reduction 218
wilt-resistant varieties, development 214
yellowing, causes 216
Almonds—
imports, origin, 1926–1932 686
production and prices, 1923–1932 508
shelled, imports, 1909–1932 673
Animal—
diseases, control by scientific methods, progress. John R. Mohler 230–241
parasites, control work of department 30–31
products—
exports and imports, value, 1929–1932 668
exports, destination, 1926–1932 674–676
imports, origin, 1926–1932 682–683
See also Dairy products; Poultry.
Animals—
exports and imports, value, 1929–1932 668
imports, origin, 1926–1932 682
prices, numbers, and kinds, changes since the war. C. L. Harlan, C. A. Burmeister, and G. B. Thorne 219–230
See also Livestock; Wild life; *and specific kinds.*
Anthracnose, cotton, damage, and control 125
Apples—
car-lot shipments, 1920–1932 .... 508, 510
cold-storage holdings, 1923–1932 511
dried, exports—
1912–1932 671
destination, 1926–1932 676–677
exports—
1919–1931 508
destination, 1926–1932 677–678
fresh, exports, 1909–1932 670
imports, 1919–1931 508
industry, importance 329
prices—
farm, 1919–1932 .... 508, 513
market, 1924–1932 .... 509, 512–513
production, 1919–1932 .... 508, 509
trade, international, 1925–1931 .... *512*

Apricots—
exports, 1912–1932 671
production, 1923–1932 514
Artichokes, acreage, production, and prices, 1929–1932 514
Asparagin, production and use by department 31
Asparagus, acreage, production, and prices 1929–1932 514
Automobiles. *See* Motor vehicles.
Avocado diseases, investigations 358
Avocados, production and prices, 1924–1932 514

Babcock, C. J.: Quality in Dairy Products Depends on Numerous Factors Other Than the Butterfat. With William White 290–295
Bacon—
exports—
1909–1932 670
destination, 1926–1932 .... *674–675*
prices at Bristol, England, 1923–1932 609
Bacterial blight, of cotton, cause, damage, and control 123
Bananas, imports—
1909–1932 672
origin, 1926–1932 685
Bankruptcies, farm, number and percentage, 1910–1932 734
Banks, Federal. *See* Federal.
Barberry eradication, work of department 77–78
Barley—
acreage, increase, result of crop feed value. H. V. Harlan *190–191*
commercial stocks, 1926–1932 454
exports—
1900–1932 .... 449, 671
destination, 1926–1932 678
feed value, cause of increased acreage. H. V. Harlan 190–191
importance as cash crop 191
imports, 1900–1932 449
marketing by farmers, 1922–1932 454
prices—
farm, 1900–1932 .... 449, 455
market, 1900–1932 .... 449–450, 456
trade, international, 1925–1932 455
Bean, L. H.: Agriculture and the World Crisis 91–95
Beans—
acreage, 1899, 1909, 1914–1932 563–564
car-lot shipments, 1922–1932 565
dry, imports, 1909–1932 672
exports, 1899, 1909, 1914–1932 563
imports, 1899, 1909, 1914–1932 563
Lima, acreage, production, and prices, 1929–1932 515
prices—
farm, 1914–1932 563
market, 1923–1932 .... *564, 566*
production and yield, 1899–1932 563–565
snap—
acreage, production, and prices, 1929–1932 515
car-lot shipments, 1921–1932 515
Beef—
exports, 1909–1932 670
grading service, progress 69
imports, 1913–1932 672
products, trade, international, 1925–1931 600
quality, factors affecting 251–252
stocks, in storage, 1923–1932 599
trade, international, 1925–1931 600
See also Meats.
Beets, acreage, production, and prices, 1929–*1932* *516*

Page
Berry industry, importance 332–333
Birds. *See* Game; Wild life.
BLACK, W. H.: Experiments with Beef and Dual-Purpose Cattle Aid in Efficient Production. With E. W. Sheets and J. A. Gamble 241–252
Blister rust, white-pine, eradication, work of department 78
Bollworm, pink, control, work of department .. 79, 80
Borer, corn. *See* Corn borer.
Bran, prices wholesale, 1923–1932 421
Bread, prices in leading cities, 1923–1932 420
Breeding, dairy cattle, value of genetics. M. H. Fohrman 280–284
Bridges, State, disbursements, 1931 758
BROWN, B. E.: Wheat Does Best in Well-Drained, Fertile Loams; Responds to Fertilizer 158–161
BUCKLEY, S. S.: Trend in Hog Production Is toward Efficiency and Quality of Product. With O. G. Hankins 252–263
Buckwheat—
acreage and production, 1919, 1932 .... 468, 469
exports, 1919–1931 468
imports, 1919–1931 468
prices—
farm, 1919–1932 .... 468, 469
market, 1919–1932 468–469
Bull associations, cooperative dairy, number, 1906–1932 640
BURMEISTER, C. A.: Prices, Numbers, and Kinds of Animals Vastly Changed Since the War. With C. L. Harlan and G. B. Thorne 219–230
BURMEISTER, G.: Decade of Expansion Leaves Most Products Depressed; But a Few Are in Active Demand. With Wells A. Sherman and A. C. Edwards 319–325
Butter—
creamery—
cold-storage holdings, 1923–1932 647
prices, 1910–1932 650–651
production, 1922–1931 645–646
exports—
1909–1932 670
destination, 1926–1932 674
imports—
1909–1932 672
origin, 1926–1932 682
market receipts, 1919–1932 .... 646–647, 648
production, shift from farm to factory, 1921–1930 280
trade, international, 1925–1931 649
Butterfat—
effect on quality of dairy products. William White and C. J. Babcock 290–295
feed cost and value, 1931 639
prices, farm, 1923–1932 645
production, relation to feed costs 288
Broomcorn—
acreage and production, 1915–1932 571–572
prices, farm, 1915–1932 571
prices, market, 1931–1932 572
supply and distribution, 1925–1932 572
yields, 1931–32 571–572

Cabbage—
acreage and production, 1929–1932 517–519
car-lot shipments, 1921–1931 516
prices, farm, 1929–1932 517–519
Cacao beans—
imports—
1909–1932 672
origin, 1926–1932 684
See also Cocoa.
Calcium gluconate, production by department 40
CALDWELL, J. S.: Quality Progress Marks Present Stage of Canning, Drying, and Preserving 344–348
Calves—
heifer, number *on farms*, 1920–1933 635–636
number on farm and value, 1900–1933 589–590
shipments, slaughter, production, and income, by States, 1931 597–598
slaughter—
in specified countries, 1923–1932 599
under Federal inspection, 1900–1932 596
Calves—Continued. Page
veal, prices, 1923–1932 595
See also Cattle.
Canning—
home, increase by farm women 388–391
drying, and preserving, quality, progress. J. S. Caldwell 344–348
Cantaloupes—
acreage and production, 1929–1932 520–521
car-lot shipments, 1921–1932 520
prices, farm, *1929–1932* *520–521*
CARPENTER, ROWENA SCHMIDT: Dairy Product's Nutritive Value Justifies Large Place in Family Diet 295–298
Carrots—
acreage and production, 1929–1932 521
car-lot shipments, 1921–1931 521
prices, farm, 1929–1932 521
Casein, value and use 300–301
Cash—
expenditures, farmers, changes 375–376
grains, relative worth since 1929 in comparison with feed crops. C. M. Purves, F. J. Hosking, and C. L. Harlan 171–179
Cattle—
beef—
and dual-purpose, production experiments. E. W. Sheets, W. H. Black, and J. A. Gamble 241–252
prices, 1923–1932 595–596
breeding for improvement 242–244
dairy—
breeding, value of genetics in. M. H. Fohrman 280–284
numbers, distribution, and production per cow 280
purebred, number registered, by breeds, 1921–1932 636
See also Cows, dairy; Dairy herd.
dual-purpose, and beef production, experiments. E. W. Sheets, W. H. Black, and *J. A. Gamble* 241–252
diseases, control by scientific methods .. 230–232, 233, 236–237, 239
fattening—
experiments 179–181
for market, methods 248–251
feeding and management 246–248
finishing for beef 248–251
imports, origin, 1926–1932 682
improvement by record-of-performance method 244–246
inspected, shipments, 1923–1932 594
number—
in various countries, 1921–1931 591–592
on farm and value, 1900–1933 589–590
production cycles, 1880–1932 222–224
receipts at stockyards, 1923–1932 593–594
shipments, slaughter, production, and income, by States, 1931 597–598
slaughter in specified countries, 1923–1932 .. 599
tick eradication, status, 1932 600
tuberculin-tested, 1923–1932 638
See also Calves; Cows; Dairy herd; Heifers.
Cauliflower, acreage, production, and prices, 1929–1932 522
Celery—
acreage, production, and prices, 1929–1932 .. 522
diseases, control 339–341
Cereal *grains, feeding experiments for ways* of profitable use. A. T. Semple 179–181
Cereals, feeding to livestock, experiments .. 179–181
Cheese—
American—
Cheddar, production, 1920–1931 651–652
cold-storage holdings, 1923–1932 654
exports—
1909–1932 670
destination, 1926–1932 674
imports—
1909–1932 672
origin, 1926–1932 682
market receipts, 1919–1932 652–653
prices wholesale, 1924–1932 654
trade, international, 1925–1931 665
value in diet 298
Cherries, production, *imports*, and exports, 1924–1932 523
Chick, baby, industry, development 210

Chickens— Page
live, prices to producers, 1923-1932 662
number and value, 1925-1932 656-658
production, changes, 1924-1932 304-305
See also Poultry.
Citrus—
fruits—
car-lot shipments, 1921-1932 524
coloring, methods 351
production, 1899, 1909, 1919-1932 523
shipments by cooperative associations, 1929-1931 772
growers, experiments with new citrus varieties. T. Ralph Robinson and A. D. Shamel 325-328
Clothing costs, *cutting* by home readjustments 392-393
Clover seed—
acreage, yield, and production, 1930-1932 584-585
imports, origin, 1926-1932 688
prices—
farm, 1923-1932 586
market, 1930-1932 584-585
receipts, 1923-1932 585
Clubs, 4-H—
dairy activities 295
number and enrollment, 1926-1931 776
Cocoa—
imports—
1909-1932 672
origin, 1926-1932 684
See also Cacao beans.
Coconut—
meat, imports, 1909-1932 673
oil, trade, international, 1925-1931 696
See also Copra.
Coffee—
imports—
1909-1932 672
origin, 1926-1932 684
trade, *international, 1925-1931* 694
Cole, John S.: Wheat's Rotation Use Is Largely Determined by Crop Competition. With S. C. Salmon 153-158
Collier, G. A.: Wheat's Economic Position Affected by Surpluses and World Trade Restrictions. With Joseph L. Orr and E. J. Working 139-147
Community facilities, use in rural districts 385
Cook, O. F.: One-Variety Community Plan Shows Numerous Practical Advantages. With C. B. Doyle 132-138
Cooperative extension—
work, *projects*, 1925-1931 775
workers, number employed in United States, 1931-1932 774
Copenhagen, *prices of butter*, 1923-1932 650
Copra—
imports, origin, 1926-1932 688
trade, *international, 1925-1931* 696
See also Coconut.
Corn—
acreage, 1890-1932 431-432, 435-436
borer, European, control methods 217
breeding for seed corn 182-190
by-products, investigations by department 40
canned, pack, 1929-1932 528
commercial stocks, 1926-1932 437
exports—
1909-1932 671
destination, 1926-1932 678
futures trading, 1924-1932 439-440
hybrids—
description and advantages 184-187
result of crossing carefully selected parent lines. *Frederick D. Richey* 182-190
inbred—
crossing for hybrid production 182-190
selection for crossing 183-184
marketings by farmers, 1922-1932 437
pollination, control 183
prices—
farm, 1890-1932 431, 438
market, 1890-1932 431-432, 439
production—
and yields, 1890-1932 431-436
costs, 1931 709
reproduction method, description 182
seed, hybrid, production 187-188
Corn—Continued. Page
sweet—
acreage, production, and prices, 1929-1932 528
wilt-resistant varieties, development by department 27
trade, *international*, 1925-1932 438
webworms, control method 217-218
world production, 1900-1932 434
yields from hybrids and open-pollinated varieties, comparison 188-189
Corn Belt, erosion control, practices 60-61
Cornstarch, exports, 1909-1932 671
Cotton—
acreage, 1890-1932 472-474
American—
Egyptian, development and progress 44
maintenance despite growth of foreign competition. Lawrence Myers, L. D. *Howell, and B. H. Thibodeaux* 97-107
communities, one variety, progress, requirements, and types 135-138
consumption—
1919-1932 476, 477
postwar 100-101, 104
crop, American, improvement, handicap *due to multiplicity of varieties.* C. B. Doyle 107-114
deterioration, causes 132
diseases, damage to crop. D. C. Neal 121-125
exports—
1890-1932 472, 478
destination, 1926-1932 678
discussion by Secretary 12
farms, situation 106-107
grade and staple—
and carry-over, 1928-1932 476
estimates, use in quality improvement 40-50
growers, *aid by live-at-home plans and soil* building. C. B. Doyle 114-118
growing—
fertilizers for, composition and placement. *J. J. Skinner* 118-121
practices, recommendations 115-117
imports, 1890-1932 472, 478
improvement by one variety community. O. F. Cook and C. B. Doyle 132-138
insects, control measures 126-132
lint—
exports, 1909-1932 670
production, 1909-1933 473, 475
linters, exports—
1914-1932 670
destination, 1926-1932 676
marketing, cooperative associations 134
marketings by farmers, 1922-1932 475
middling, spot prices, 1915-1933 479, 480-481
mill consumption in United States and *foreign countries*, 1913-1932 477
novelty varieties, description and disadvantages 113-114
one-variety, *community plan, practical* advantages. O. F. Cook and C. B. Doyle 132-138
pests, control by *culture*, insecticides, and quarantines. R. W. Harned 126-132
picking and ginning, precautions 117-118
premiums and discounts, *1923-1932* 480, 481
prices—
at Liverpool, 1923-1933 480
farm, 1890-1933 472-473, 478
production—
1890-1933 472-475
1932, discussion by Secretary 9
costs, 1931 708
post-war 98-100
quality, importance in foreign competition 102-104
raw, imports, origin, 1926-1932 684
root rot, cause, development, and control 121-122
seed certification, advantages 109
situation, review 97-107
statistics, 1890-1932 472-484
superior variety, characteristics 109-113
supply and *distribution, 1913-1932* 477
trade, international, 1925-1932 478
transportation developments 105-106
unmanufactured, imports, 1909-1932 672
utilization, changes 104-106

Cotton—Continued. Page
variety registration, advantages 109
work on 97–138
world production, 1909–1933 475
yields, 1890–1932 472–473
Cottonseed—
cake and meal, exports, 1909–1932 670
meal, prices, 1923–1932 484
oil—
exports, destination, 1926–1932 681
prices, 1923–1932 483
trade, international, 1928–1931 482
prices, farm, 1922–1932 481, 483
production, 1909–1932 481–482
products, production, 1909–1932 482
Cowpeas—
acreage, production, and value, 1931–1932 570
prices—
farm, 1923–1932 570
market, 1923–1932 571
Cows—
dairy—
records of output, basis of successful dairying. J. C. McDowell 287–290
See also Cattle, dairy; Cows, milk.
milk—
numbers, 1880–1933 634, 635, 637
prices to producers, 1923–1932 639
value per head, 1880–1933 632
yield on farms, 1929–1932 637–638, 639
See also Cattle.
Cranberries, production and prices, 1924–1932 528
Cranberry, false blossom, control methods 358
Cream—
imports, 1909–1932 673
market receipts, by origin, 1931 and 1932 642
quality, improvement program 290–295
Credit—
corporation, organization, discussion by Secretary 8
farm, facilities, discussion by Secretary 6–7
See also Loans; Mortgage.
Crop—
estimates, accuracy, discussion by Secretary 70
production—
1932, and other years, discussion by Secretary 9–11
adjustment to demand, research 43–45
summary, acreage, production, and yield, 1930–1932 697–698
Crops, miscellaneous, statistics 563–588
Crotalaria, uses, experiments by department 29
Crown-gall organism, control studies 355–356
Cucumbers—
acreage and production, 1929–1932 529
car-lot shipments, 1921–1932 529
prices, farm, 1929–1932 529
Currants, dried, imports, origin, 1926–1932 685

Dairy—
and poultry statistics 634–666
by-products, utilization by industry. L. A. Rogers 299–302
cattle. *See* Cattle, dairy; Dairy herd.
cost cutting, discussion by Secretary 29–30
cows. *See* Cows, dairy.
herd-improvement associations—
number, 1906–1932 640
value to farmer 287–290
production costs, decrease by better feed crops and pastures. T. E. Woodward 284–287
products—
foreign trade, changes 280–281
importance in diet 291
investigations by department 42
marketing associations, number and estimated business, 1925–26, 1928–1931 770
nutritive value, importance in family diet. Rowena Schmidt Carpenter 295–298
prices, factors affecting 275–280
prices, relation to feed prices and feeding 176–179
quality, factors other than butterfat affecting. William White and C. J. Babcock 290–295
quality improvement by department 46
quality produced, 1924–1931 640–641
situation, 1932 11

Dairying— Page
effect of changing dollar value and production cycle. E. W. Gaumnitz, E. E. Vial, and J. B. Shepard 275–280
success, dependence on high-producing cows. J. C. McDowell 287–290
work on 275–302
Date scale, eradication, work by department 78–79
Dates—
dried, imports, origin, 1926–1932 685
production and prices, 1924–1932 529
Deguelin, development by department 33
Dehydration, fruits and vegetables, practicability 361
Depression—
effect on—
agriculture 91–95
cotton industry 97, 101, 106
farm efficiency 381–382
livestock situation 222, 227, 228
poultry industry. Samuel A. Jones, Gordon W. Sprague, and Alexander Sturges 303–308
relation to agriculture, discussion by Secretary 1–2, 3
Diet, family, importance of nutritive value of dairy products. Rowena Schmidt Carpenter 295–298
Disease and pest control, review by Secretary 76–82
DOYLE, C. B.:
Live-at-Home Plans and Soil Building Aid Cotton Growers 114–118
Multiplicity of Varieties Handicaps Improvement in the American Cotton Crop 107–114
One-Variety Community Plan Shows Numerous Practical Advantages. With O. F. Cook 132–138
Drainage enterprises, financial difficulties 55–56
Drying, canning, and preserving, quality, progress. J. S. Caldwell 344–348
Duck—
diseases, investigations by department 80–81
raising, importance 317
Dust explosions, investigations by department 38

EDWARDS, A. C.: Decade of Expansion Leaves Most Products Depressed; but a Few Are in Active Demand. With Wells A. Sherman and G. Burmeister 319–325
Egg—
albumen, imports—
1921–1932 673
origin, 1926–1932 682
products, trade, international, 1925–1931 665
yolks, imports—
1921–1932 673
origin, 1926–1932 682
Eggs—
and poultry 303–308
cold-storage holdings, 1923–1932 664
exports, 1909–1932 670
imports—
1909–1932 673
origin, 1926–1932 682
market receipts, 1919–1932 662, 663, 664
prices—
farm, 1923–1932 664
market, 1923–1932 666
production—
and prices, 1932 11
and value, 1925–1932 663
increase by careful breeding and management. Alfred R. Lee and Morley A. Jull 308–317
increases 305–306
quality, improvement 314–315
trade, international, 1925–1931 665
Engineering appliances, development by department 34–35
ENLOW, C. R.: Pasture Experiments Point Way to More Profitable Grazing. With H. N. Vinall and A. T. Semple 205–212
Erosion, problems, discussion by Secretary 59–63
European corn borer. *See* Corn borer, European.

Expenditures— Page
classification by types and units 17-18
department, discussion by Secretary 12-21
Export crops, trend, discussion 371-372
Exports—
1908-1932, summary 667
agricultural products, discussion by Secretary 3, 11-12
farm products, discussion by Secretary 3
See also under specific crops.
Extension activities and accomplishments, 1926-1931 775
Extension Service, work, review by Secretary 72-75

Families, farm, living standards, studies, 1922-1932 737-739
Family—
expenditures for household articles, reduction 393-395
living, readjustments, comparison with farming adjustments. Hildegarde Kneeland and Hazel K. Stiebeling 385-397
Farm—
business—
and related statistics 697-739
and the farm home 369-397
studies, by States, 1924-1931 710-728
commodities, demand, discussion by Secretary 2-3
credit. *See* Credit.
families, living standards, studies, 1922-1932 737-739
home—
and the farm business 369-397
readjustments made by the women 385-397
income. *See* Income.
management—
financial, causes of loss 382-383
research and results 30, 45
mortgage debt, estimation, 1910-1932 735
prices. *See* Prices, farm; *and under specific crop*, farm prices.
production—
costs, changes 374
income, gross, 1909-1931 700-703
program, reshaping, discussion 369-371
products, exchange value, decrease 94
readjustments, resourcefulness and promptness of farmers. C. L. Holmes and V. N. Valgren 369-384
real estate. *See* Real estate.
returns, 1923-1931 704-705
upkeep, problems of adjustment 378-381
value. *See under specific crop*, farm value.
Farmers, readjustments, resourcefulness and promptness. C. L. Holmes and V. N. Valgren 369-384
Farming—
efficiency during the depression 381-382
fundamental changes, 1928-1932 370-371
Farms—
cotton, situation 106-107
number, 1928-1932 733
Federal—
intermediate credit banks, marketing-credit facilities 8
land banks—
extension of mortgage credit to farmers 8-9
interest and discount rates, and bond yields, 1917-1932 736
Feed—
crops—
acreage and production, 1932 9-10
attack by hundreds of different kinds of insects. W. H. Larrimer 216-218
improved, necessity in lowered dairy production costs. T. E. Woodward 284-287
relative worth since 1929 *in comparison with cash grains.* C. M. Purves, F. J. Hosking, and C. L. Harlan 171-179
grains and forage 171-218
prices, relation to prices of livestock and dairy products 176-179
production and prices, effect on livestock situation 221-222

Feeding— Page
experiments with cereal grains, indication of ways of profitable use. A. T. Semple 179-181
poultry, efficiency studies 312-313
Feeds, by-product, production, development 173-174
Fertilizer materials—
production, 1927-1931 761, 763
Sales and value, 1929-1931 761
Fertilizers—
consumption, 1921-1931 762-763
effect on pastures 206-207
exports, 1927-1931 763
for—
cotton, composition and placement. J. J. Skinner 118-121
cotton, formulae 115-116, 118-120
wheat, practices and methods of application 159-161
imports, 1927-1931 763
prices, decreases 830
production, 1927-1931 761, 763
research work of department 31-33
sales, 1929-1931 761, 763
use, adjustments 376-377
Fibers—
animal, imports, origin, 1926-1932 682-683
vegetable, *imports, origin*, 1926-1932 684
See also under specific names.
Field crops, harvested acreage, 1930-1932 699
Figs—
dried, imports, origin, 1926-1932 685
production and prices, 1922-1932 530
Filberts, imports, origin, 1926-1932 687
Fisher, D. F.: Methods of Handling, Transporting, and Storing Perishables Improved 348-354
Flax—
unmanufactured, *imports, origin*, 1926-1932 684
varieties, development by department 28
See also Flaxseed; Linseed.
Flaxseed—
acreage, 1909-1932 456-459
cake, *exports, destination*, 1926-1932 680
commercial stocks, 1926-1932 460
imports—
1909-1932 673
origin, 1926-1932 688
marketing by farmers, 1922-1932 460
prices—
farm, 1909-1932 456, 461
market 456-457, 462
production and yields, 1909-1932 456-459
trade, international, 1925-1931 461
world production, 1919-1933 457
See also Flax; Linseed.
Flour, wheat—
exports—
1909-1932 671
destination, 1926-1932 680
prices, wholesale, 1923-1932 420
Fohrman, M. H.: Breeding Better Dairy Cattle Facilitated by Studies in Genetics 280-284
Food—
and drugs act—
administration, discussion by Secretary 86-87
enforcement 240-241
production program, farm homes 387-392
program, emergency, benefits, discussion by Secretary 70-72
supply, farm family, *readjustments* 386-392
Foods—
preservation methods 359-362
rancidity, investigations by department 37
Foot-and-mouth disease, eradication, work of department 76
Forage—
and feed grains 171-218
crops, attack by hundreds of different kinds of insects. W. H. Larrimer 216-218
Foreign agricultural service, department, discussion by Secretary 65-67
Forest products—
exports and imports, value, 1929-1932 668
selected, exports and imports, 1909-1932 669
utilization, research by department 42-43

Page

Forestry, extension programs, discussion by Secretary 74
Freezing, foods, studies 359–361
Freight tonnage, on railways, 1925–1931 773
Frost, killing dates, with length of growing season 744–745
Fruit—
 by-products, investigations by department 41–42
 crops, production, 1932 10
 diseases, control by new method, progress. M. B. Waite 354–359
 growers, aid by foreign agricultural service 66–67
 industries, trend toward higher-quality production. J. R. Magness 328–335
 juices, freezing, methods 360–361
 pests, control, development of new methods. B. A. Porter and W. H. White 364–368
Fruits—
 and vegetables 319–325
 canned—
  dried, and fresh, exports, 1912–1932 669, 676
  exports, destination, 1926–1932 678
 dried, imports, origin, 1926–1932 685
 frozen and preserved, cold-storage holdings, 1923–1933 560
 frozen-pack, progress 346, 349, 359
 preservation methods 361–362
 refrigeration methods, improvement 352–353
 shipping, economical methods 353–354
 spray-residue removal, methods 350–351
 statistics 508–560
 storage investigations by department 37
 unloads at markets, 1924–1932 561–562
 utilization, aid by chemical discoveries. Henry G. Knight 359–364
Fumigants, development by department 35
Fungicides—
 imports and exports, 1927–1931 764
 prices, at New York, 1923–1932 764
 production, 1927–1931 764
Furfural, production by department 40
Fusarium wilt, of cotton, cause, symptoms, and control 123

Gamble, J. A.: Experiments with Beef and Dual-Purpose Cattle Aid in Efficient Production. With E. W. Sheets and W. H. Black 241–252
Game—
 laws, ruling by department 85
 See also Wild life.
Gardening, home, adjustments by farm women 387–388, 389, 391–392
Gardens, home, increases 319–320
Gasoline taxes, 1931 760
Gaumnitz, E. W.: Changing Dollar Value and Production Cycle Greatly Affect Dairying. With E. E. Vial and J. B. Shepard 275, 280
Geese raising, importance 317
Genetics, value in breeding better dairy cattle. M. H. Fohrman 280–284
Gipsy moth, eradication, work by department 79
Glass-Steagall bill, provision of credit 7
Glucose, exports, 1909–1932 671
Goats, numbers clipped and average clip, 1930–1932 625
Goatskins, imports, 1909–1932 672
Grades, Federal, promotion of trade 67–69
Grading service, department, usefulness 46–49, 67–69

Grain—
 apportionment to cattle, feeding studies 287
 crops—
  acreage and production, 1932 9–10
  new varieties, development by department 26–27
 feed, *production and prices, effect on live*stock situation 221–222
 futures act, administration, discussion by Secretary 83–84
Grains—
 cereal, feeding experiments for ways of profitable use. A. T. Semple 179–181
 exports, destination, 1926–1932 678–680
 feed—
  and forage 171–218
  production, 1912–1932 171, 172–176, 175, 178
  utilization 174–175
 imports, origin, 1926–1932 685–686

Grains—Continued. Page
 infestation, different kinds of insects 216–218
 statistics 399–471
 See also under specific kinds.
Grapefruit—
 car-lot shipments, 1921–1932 524
 exports, destination, 1926–1932 678
 fresh, exports, 1922–1932 671
 prices, auction, 1924–1932 525
 See also Citrus fruits.
Grapes—
 car-lot shipments, 1921–1932 531
 exports—1922–1932 671
 imports and exports, 1922–1932 530
 industry, importance 331–332
 prices, 1922–1932 530, 531–533
 production, 1922–1932 530
Grasshoppers, control work by department 82
Grazing—
 close, advisability 286–287
 profitable, result of pasture experiments. H. N. Vinall, C. R. Enlow, and A. T. Semple 205–212
Green manure, *crops for wheat* 160

Hams, exports—
 1909–1932 670
 destination, 1926–1932 675
Hankins, O. G.: Trend in Hog Production Is toward Efficiency and Quality *of* Product. With S. S. Buckley 252–263
Harlan, C. L.—
 Feed Crops Since 1929 Worth Relatively More Than the Cash Grains. With C. M. Purves and F. J. Hosking 171–179
 Prices, Numbers, and Kinds of Animals Vastly *Changed Since the War. With* C. A. Burmeister and B. G. Thorne 219–230
Harlan, H. V.: Barley Acreage Is Increasing Because of Crop Feed Value 190–191
Harned, R. W.: Culture, Insecticides, and Quarantines Help Control Cotton Pests 126–132
Hay—
 acreage and yields, 1919–1932 573–575
 exports, 1919–1932 575
 imports, 1919–1932 575
 prices—
  farm, 1931–1932 573–575, 576
  market, 1922–1932 577
 production, 1912–1932 172, 173, 175, 573–575
 receipts at markets, 1925–1932 575
Heat, effect on nutritive value of milk 296–297
Heifers, number on farms, 1920–1933 635–636
Henequen, imports—
 1909–1932 673
 origin, 1926–1932 684
Hides—
 imports, 1909–1932 672
 prices at Chicago, 1923–1932 628
Highways—
 Federal-aid, wage rates, 1923–1932 761
 State—
  disbursements, 1931 758
  income and funds available, 1931 757
  mileage, 1921, 1923–1931 756
 See also Roads.
Hogs—
 cholera control work, 1919–1932 610
 diseases, control by scientific methods 231–232, 237–238, 241
 dressing and cutting yields 259–261
 live weight at Chicago, 1923–1932 604
 market classes and grades 258–259
 numbers and value, 1931–1933 601–602
 numbers in various countries, 1921–1931 602–603
 prices—
  1929–1932 226
  at Chicago, 1923–1932 605
  farm, 1922–1932 605
 production—
  cycles, 1920–1932 225–227
  trend toward efficiency and quality of product. S. S. Buckley and O. G. Hankins 252–263
  value, 1931 606
 receipts at stockyards, 1923–1932 604
 shipments and slaughter, 1931 606
 slaughter, in specified countries, 1923–1932 607
 See also Pigs; Swine.

Page

HOLMES, C. L.: Farmers Resourceful and Prompt in Making Needed Readjustments. With V. N. Valgren 369-384
Home economics, department service, discussion by Secretary 70-72
Honey—
prices, 1927-1932 496
quality improvement by department 46
Hops—
acreage, production, and yield, 1922-1932 579
downy mildew, investigations by department 28
exports—
1909-1932 579, 671
destination, 1926-1932 680
imports, 1922-1932 579
prices, farm, 1922-1932 579
trade, international, 1925-1931 580
Horses—
number in various countries, 1921-1931 631-633
number on farms, 1910-1933 629, 630
prices, 1923-1932 629
production cycles, 1910-1932 228-230
HOSKING, F. J.: Feed Crops Since 1929 Worth Relatively More Than the Cash Grains. With C. M. Purves and C. L. Harlan 171-179
HOWELL, L. D.: American Cotton Holds Ground Despite Growth of Foreign Competition. With Lawrence Myers and B. H. Thibodeaux 97-107
HUMPHREY, H. B.: Wheat Is Attacked by Rusts, Smuts, and Other Destructive Diseases 161-168
Hunters' licenses, returns by States, 1930-31 753
HYDE, Secretary: The Year in Agriculture 1-89

Imports—
1908-1932, summary 667
agricultural products, discussion by Secretary 11-12
See also under specific crop.
Income—
cash, contributions of farm women 396-397
department—
activities 20
discussion by Secretary 12-21
farm—
1932, comparison with other years 4
net, use during the depression 383-384
shrinkage, discussion by Secretary 2-3
gross, from farm products, 1909-1931 700-703
Index numbers—
farm—
prices, 1910-1932 729-731
prices, 1932, discussion by Secretary 1-2
real estate, 1912-1932 733
wages, 1909-1932 732
prices paid by farmers, 1910-1932 729
volume of agricultural production, 1919-1932 699
wholesale prices, 1900-1932 731
Information service, work of department 74-75
Insect-pest surveys, scope and value 81-82
Insect pests, control measures, progress 35-36
Insecticide act, enforcement 241
Insecticides—
development by department 33
efficacy in fighting insect pests 367-368
imports and exports, 1927-1931 764
investigations 363-364
prices at New York, 1923-1932 764
production, 1927-1931 764
use in control of cotton pests 131-132
Insects, damage to feed and forage crops. W. H. Larrimer 216-218
Inulin, investigations by department 41
Investments and current outlays, problems and adjustments 374-375
Irrigation—
enterprises, financial difficulties 55-56
water, investigations by department 33-34

JONES, SAMUEL A.: Poultry Industry Fairly Resistant to Depression. With Gordon W. Sprague and Alexander Sturges 303-306
Juices, fruit, freezing, methods 360-361
JULL, MORLEY A.: Breeding and Management Have Greatly Increased Average Egg Production. With Alfred R. Lee 308-317
Jute, imports, 1909-1932 678

Page

Kafir, prices at Kansas City, 1923-1932 471
KNEELAND, HILDEGARDE: Readjustments in Family Living Are as Drastic as Those Effected in Farming. With Hazel K. Stiebeling 385-397
KNIGHT, HENRY G.: Utilization of Fruits and Vegetables Aided by Chemical Discoveries 359-364

Labor—
cash expenditures for, changes, 1928-1931 377
farm, by geographic divisions, 1932 732
Lamb—
cold storage holdings, 1923-1932 619
consumption in United States 272-273
trade, international, 1925-1931 619
See also Meat; Meats; Mutton.
Lambs—
fattening for market 268-270
number on farms, 1900-1933 611, 614
prices—
at Chicago, 1923-1932 616
farm, 1922-1932 615
production value, 1931 617-618
shipments and slaughter, 1931 617-618
slaughter, under Federal inspection, 1880-1932 616
See also Sheep.
Land—
use, planning and conservation 52-65
utilization, discussion by Secretary 52-59
Lands, submarginal, relation to tax delinquency 54-55
Lard—
consumption, trends 263
exports—
1909-1932 670
destination, 1926-1932 675-676
prices, 1923-1932 607
production and consumption, 1900-1931 628
stocks, in storage, 1923-1932 608
trade, international, 1925-1931 610
LARRIMER, W. H.—
Hundreds of Different Kinds of Insects Attack Feed and Forage Crops 216-218
Wheat Is Attacked by Insects at Each Stage in Life of the Plant 169-170
LEE, ALFRED R.: Breeding and Management Have Greatly Increased Average Egg Production. With Morley A. Jull 308-317
Lemon raising, importance 327-328
Lemons—
car-lot shipments, 1921-1932 524
imports—
1909-1932 672
origin, 1926-1932 685
prices, auction, 1924-1933 526
trade, international, 1925-1931 525
See also Citrus fruits.
Lespedezas, use for pastures, varieties and regional adaptation 208-210
Lettuce—
acreage and production, 1929-1932 533
car-lot shipments, 1921-1932 534
disease-resistant, development 343-344
prices, farm, 1929-1932 533
varieties, introduction and development by department 47
Lignin investigations by department 40
Linseed—
cake, exports—
1909-1932 670
destination, 1926-1932 680
meal—
exports, 1909-1932 670
prices at Minneapolis, 1923-1932 464
oil—
prices, 1923-1932 463
production, 1919-1932 462
trade international, 1925-1931 463
See also Flax; Flaxseed.
Lint, cotton. *See* Cotton lint.
Livestock—
breeding, progress 280-284
cooperative marketing, 1918-1931 772
diseases—
control by scientific methods, progress, John R. Mohler 230-241
prevention, work of department 30-31
fattening experiments 179-181

Livestock—Continued. Page
grazed on national forests, and receipts ... 751
insects affecting, control ... 239-240
numbers, relation to feed production ... 175-176
parasites, prevention and control ... 234-238
prices—
numbers, and kinds, changes since the War ... 219-230
relation to feed prices and feeding ... 176-179
production—
changes, 1928-1932 ... 372-374
discussion by Secretary ... 10-11
remedies, Federal supervision ... 240-241
situation, effect of the War ... 219-221
slaughter, under Federal inspection, 1923-1932 ... 626
statistics ... 589-633
work of department ... 219-273
See also under specific names.
Living—
family, readjustments, comparison with farming adjustments. Hildegarde Kneeland and Hazel K. Stiebeling ... 385-397
standards, farm, studies, 1922-1932 ... 737-739
Loans—
agricultural, selected Federal and other agencies, 1917-1932 ... 736
crop production, conditions, discussion by Secretary ... 7-8
See also Credit; Mortgage.
Lumber—
consumption, 1904-1931 ... 748
exports, 1904-1932 ... 669, 748
imports—
1904-1931 ... 748
1909-1932 ... 669
production—
1929-1931 ... 747
specified years ... 748
value at mill, 1899, 1909, 1919, 1929-1931 ... 747

MAGNESS, J. R.: Fruit and Nut Industries Show Decided Trend Toward Higher-Quantity Production ... 328-335
Manila, imports—
1909-1932 ... 673
origin, 1926-1932 ... 684
Manure, application to wheat ... 159-160
Market, roadside, use by farm women ... 396-397
Marketing associations, membership and amount of business, 1931-32 ... 765-769
Markets, foreign and domestic, demands ... 38-39
MARTIN, JOHN H.: Grain Sorghums Highly Drought Resistant; Many Varieties Grown in United States ... 195-198
MCDOWELL, J. C.: Records That Show Each Cow's Output Are Basis of Successful Dairying ... 287-290
Meal. *See under specific kinds.*
Measures, equivalent weights ... 402
Meat—
imported, inspected, and passed, 1923-1932 ... 625
inspection, Federal, benefits ... 76
preparation under Federal inspection, 1923-1932 ... 626
products—
preparation under Federal inspection, 1923-1932 ... 626
trade, international, 1925-1931 ... 627
trade, international, 1925-1931 ... 627
Meats—
production and consumption, 1900-1931 ... 628
quality-improvement investigations by department ... 46
See also Beef; Lamb; Pork; Veal.
Middlings, flour, wholesale prices, 1923-1932 ... 421
Milk—
condensed—
exports, 1909-1932 ... 670
exports, destination, 1926-1932 ... 674
trade, international, 1925-1931 ... 643
evaporated—
exports, 1909-1932 ... 670
exports, destination, 1926-1932 ... 674
trade, international, 1925-1931 ... 643
feed cost and value per cow, 1931 ... 639
fluid, receipts at markets, by origin, 1931 and 1932 ... 642

Milk—Continued. Page
imports, 1918-1932 ... 673
prices—
farm, 1923-1932 ... 644
retail, 1920-1932 ... 645
production on farms, 1929-1932 ... 637-638, 639
products—
utilization ... 299-302
value in diet ... 295-298
quality, improvement program ... 290-295
skim, dry, use ... 300
vitamin-D-enriched, production and value ... 296
Milk cows. *See* Cattle, dairy; Cows, dairy; Cows, milk; Dairy herd.
Milo, varieties, development by department ... 29
Mohair—
imports, 1922-1932 ... 673
production, 1930-1932 ... 625
MOHLER, JOHN R.: Animal Disease Control by Scientific Methods Shows Notable Progress ... 230-241
Molasses—
Barbados, investigations by department ... 41
imports, 1909-1932 ... 673
MORSE, W. J.: Soybeans Now a Major Crop in United States; Few Grown Before 1898 ... 198-205
Mortgage, farm, debt, discussion by Secretary ... 5
Mortgages. See Credit; Loans.
Motor vehicles—
registration, 1931 ... 759
revenues, 1931 ... 759
Mules—
number—
in specified countries, 1921-1931 ... 621-633
on farms, 1910-1933 ... 629-630
prices, 1926-1932 ... 629
production cycle, 1910-1932 ... 228-230
Mutton—
cold storage holdings, 1923-1932 ... 619
consumption in U. S. ... 272-273
trade, international, 1925-1931 ... 619
MYERS, LAWRENCE: American Cotton Holds Ground Despite Growth of Foreign Competition. With L. D. Howell and B. H. Thibodeaux ... 97-107

National forests—
fires on, 1924-1931 ... 748
policy, discussion by Secretary ... 63-64
road and trail construction ... 89
NEAL, D. C.: Cotton Diseases Take Two Million Bales of U. S. Crop Annually ... 121-125
Nitrogen, world production, 1928-1932 ... 763
Nut—
diseases, control by new method, progress. M. B. Waite ... 354-359
industry—
importance ... 333-335
trend toward higher-quality production. J. R. Magness ... 328-335
Nuts, imports, origin, 1926-1932 ... 686-687

Oat—
regions, location, and varieties in each ... 191-195
varieties—
description and characteristics ... 192-195
regional adaptation. T. R. Stanton ... 191-195
Oatmeal, exports, destination, 1926-1932 ... 679
Oats—
acreage, 1900-1932 ... 441-442, 444-445
exports—
1909-1932 ... 671
destination, 1926-1932 ... 678
marketings by farmers, 1922-1932 ... 446
prices—
farm, 1900-1932 ... 441, 447
market, 1900-1932 ... 441-442, 448
production—
and yields, 1900-1932 ... 441-445
costs, 1931 ... 710
receipts by grades, 1922-1932 ... 446
stocks on hand, 1926-1932 ... 446-447
trade, international, 1925-1932 ... 448
varieties, development by department ... 27
world production, 1894-1933 ... 443

Oil cake— Page
exports, destination, 1926–1932 680
trade, international, 1925–1931 691–693
Oil-cake meal, trade, international, 1926–1931 691–693
Oils—
vegetable—
exports, 1909–1932 690
exports, destination, 1926–1932 681
imports, 1909–1932 690
imports, origin, 1926–1932 687–688
See also under specific kinds.
Oilseeds, imports, origin, 1926–1932 688
Oleo oil, exports—
1909–1932 670
destination, 1926–1932 676
Oleomargarine—
consumption, 1924–1932 655
manufacture, materials used, 1922–1932 656
market prices, 1923–1932 656
production, 1922–1932 655
Olive oil—
imports, origin, 1926–1932 687–688
trade, international, 1925–1931 534–535
Olives—
imports—
1909–1932 672
origin, 1926–1932 685
production and prices, 1923–1932 534
Onions—
acreage and production, 1929–1932 536
car-lot shipments, 1921–1932 537
imports—
1909–1932 672
origin, 1922–1932 535
prices—
farm, 1929–1932 536
market, 1923–1932 537
Orange—
juice, quality improvement by department 47–48
Satsuma, early ripening strain, development by department 44
Oranges—
car-lot shipments, 1921–1932 524
exports—
1909–1932 670
destination, 1926–1932 678
prices, auction, 1924–1933 527
trade, international, 1925–1931 526
See also Citrus fruit.
ORR, JOSEPH L.: Wheat's Economic Position Affected by Surpluses and World Trade Restrictions. With G. A. Collier and E. J. Working 139–147

Packers and stockyards act, enforcement by department 84–85
Paper production, 1899, 1904–1931 749, 750
Parasitism, in livestock and poultry, prevention and control 234–238
Pasture—
condition, first of month, 1909–1932 577–578
crops, supplementary 207–208
experiments, cause of more profitable grazing. H. N. Vinall, C. R. Enlow, and A. T. Semple 205–212
plants, varieties for specified regions 207–212
Pastures—
improved, necessity in lowered dairy production costs. T. E. Woodward 284–287
improvement by use of fertilizers 205–207
Peach—
bacterial spot, control methods 357
industry, importance 330–331
Peaches—
canned, exports, 1922–1932 671
car-lot shipments, 1923–1932 538, 540
exports, 1913–1932 538
phony disease—
control studies 356–357
eradication work of department 78
prices—
farm, 1913–1932 538
market, 1923–1932 539, 540
production, 1913–1932 538, 539
Peanut oil—
prices, 1923–1932 583
production, 1922–1932 582
trade, international, 1925–1931 583
Peanuts— Page
acreage, yield, and production, 1919–1932 580–581
imports, origin, 1926–1932 687
prices, farm, 1919–1932 580–581
shelled, imports, 1909–1932 673
trade, international, 1925–1931 582
yields, improvement 342–343
Pear—
cluster rot, control 357–358
industry, importance 330
Pears—
car-lot shipments, 1922–1932 541
exports, 1913–1932 541, 671
prices, 1913–1932 541
production, 1913–1932 541, 542
Peas—
acreage and production, 1929–1932 543, 584
canned, pack in United States, 1919–1932 544
car-lot shipments, 1925–1932 543
prices, farm, 1929–1932 543
Pecans, production and prices, 1924–1932 544
Pepper, imports, origin, 1926–1932 689
Peppers, acreage, production, and prices, 1929–1932 545
Perishable commodities act, benefits, discussion by Secretary 85
Perishables, handling, transporting, and storing methods, improvement. D. F. Fisher 348–354
Pests, control work, review by Secretary 78–82
Pigs—
growing and fattening 257–258
numbers and value, 1931–1933 601–602
See also Hogs; Swine.
Pineapples, canned, exports, 1922–1932 671
Plant pests, control work of department 78–80, 81–82
Plums, production, and prices, 1929–1932 545
Pollination, control in corn breeding 183, 188
Population movements, discussion by Secretary 56–57
Pork—
consumption, 1902–1931 262–263
exports—
1909–1932 670
destination, 1926–1932 675
products, trade, international, 1925–1931 609
soft, problem 261–262
stocks, in storage, 1923–1932 608
trade, international, 1925–1931 609
See also Meats.
PORTER, B. A.: Research Develops New Ways to Fight Pests of Fruits and Vegetables. With W. H. White 364–368
Potato—
crop, 1932 9, 10
diseases, control 341–342
production, trends 324
Potatoes—
acreage and production, 1900–1931 546–549
car-lot shipments, 1923–1932 550
exports, 1909–1932 546
imports, 1909–1932 546
prices—
farm, 1909–1932 546, 548, 551
market, 1923–1932 546–547, 552
storage, investigations 351
trade, international 551
POTTS, C. G.: Sheep Raising in U. S. Has Changed Greatly Since Pioneer Period. With D. A. Spencer 264–273
Poultry—
and dairy statistics 632–664
and eggs 303–308
dressed, market receipts, 1923–1932 659–661
frozen, cold-storage holdings, by months, 1923–1932 661
industry—
progress 308–317
resistance to depression. Samuel A. Jones, Gordon W. Sprague, and Alexander Sturges 303–308
live, freight receipts, 1926–1932 659
management, improvement trends 313–314
parasites, types, prevention, and control 238
products—
prices, decrease 306, 307, 308
value in diet 315–316
remedies, Federal supervision 240–241
situation, discussion by Secretary 11
See also Chickens; Turkeys.

Precipitation— Page
selected points, by months, 1932 742–743
See also Rainfall.
Preserving, canning, and drying, quality, progress. J. S. Caldwell 344–348
Price slump, causes and effect upon agriculture 91–95
Prices—
alfalfa seed, 1923–1932 586
almonds, 1923–1932 508
animals, changes since the war. C. L. Harlan, C. A. Burmeister, and O. B. Thorne 219–230
apples, 1919–1932 508, 509, 512–513
artichokes, 1929–1932 514
asparagus, 1929–1932 514
avocados, 1924–1932 514
bacon, 1923–1932 609
barley, 1900–1932 449–450, 455, 456
beans, 1914–1932 515, 563–564, 566
beets, 1929–1932 516
bread, 1923–1932 420
bran, 1923–1932 421
broomcorn, 1915–1932 571–572
buckwheat, 1919–1932 468–469
butter, 1910–1932 650–651
butterfat, 1923–1932 645
cabbage, 1929–1932 517–519
cantaloupes, 1929–1932 520–521
carrots, 1929–1932 521
cauliflower, 1929–1932 522
celery, 1929–1932 522
cheese, wholesale, 1924–1932 654
chickens, 1923–1932 662
clover seed, 1923–1932 584–586
corn, 1890–1932 431–432, 438, 439, 528
cotton, 1890–1933 472–473, 478–481
cottonseed—
1922–1932 481, 483
meal, 1923–1932 484
oil, 1923–1932 483
cowpeas, 1923–1932 570–571
cows, milk, farm, 1923–1932 639
cranberries, 1924–1932 528
cucumbers, 1929–1932 529
dairy products—
factors affecting 275–280
relation to feed prices and feeding 176–179
eggs, 1923–1932 11, 664, 666
farm—
1932, discussion by Secretary 1–2
index numbers, 1932, discussion by Secretary 1–2
relation to purchasing power, discussion by Secretary 3
See also under specified crop, farm prices.
feed and livestock, relation to feeding 176–179
fertilizers, decreases 320
field seeds, 1923–1932 588
figs, 1922–1932 530
flaxseed, 1909–1932 456–457, 461, 462
flour middlings, 1923–1932 421
flour, wheat, 1923–1932 420
grapefruit, 1924–1932 525
grapes, 1922–1932 530, 531–533
hay, 1922–1932 573–577
hogs, 1929–1932 226
honey, 1927–1932 496
hops, 1922–1932 579
kafir, 1923–1932 471
lambs, 1922–1932 615–616
lemons, 1924–1932 526
lettuce, 1929–1932 533
linseed—
meal, 1923–1932 464
oil, 1923–1932 463
maple sugar and sirup, 1917–1932 495
milk, 1920–1932 644–645
oats, 1900–1932 441–442, 447, 448
oleomargarine, 1923–1932 656
olives, 1923–1932 534
onions, 1929–1932 536, 537
oranges, 1924–1932 527
peaches, 1913–1932 538, 539, 540
peanut oil, 1923–1932 583
peanuts, 1919–1932 580–581
pears, 1919–1932 541, 542
peas, 1929–1932 543
pecans, 1924–1932 544
Prices—Continued. Page
peppers, 1929–1932 545
plums, 1929–1932 545
potatoes, 1909–1932 546–548, 551–552
poultry products, decrease 306, 307, 308
prunes, 1929–1932 545
rice, 1909–1932 464–465, 468
rye, 1909–1932 423–424, 430
sheep, 1923–1933 227, 614, 615, 616
sorghums, 1919–1932 470–471
sorgo sirup, 1930–1932 494
soybeans, 1923–1932 567, 569
spinach, 1929–1932 554
strawberries, 1929–1932 555
sugar, retail and wholesale, 1923–1932 494
sugarbeets, 1911–1932 484–485
sugarcane sirup, 1930–1932 495
sweetpotatoes, 1919–1932 552, 553, 554
timothy seed, 1923–1932 586, 587
tobacco, 1890–1932 497–499, 501–503
tomatoes, 1929–1932 557
turkeys, 1923–1932 662
velvetbeans, 1930–1932 571
walnuts, 1923–1932 559
watermelons, 1929–1932 559, 560
wheat, 1890–1932 403–404, 406, 415, 418–420
wool, 1923–1932 623–625
Prunes—
exports—
1909–1932 670
destination, 1926–1932 677
production and prices, 1929–1932 545
Pulpwood, consumption, 1899, 1904–1931 749, 750
Purchasing associations, membership and amount of business, 1931–32 765–769
PURVES, C. M.: Feed Crops Since 1929 Worth Relatively More Than the Cash Grains. With F. J. Hosking and C. L. Harlan 171–179

Quarantine enforcement, work of department 79
Quarantines, efficacy in control of cotton pests 130

Rainfall—
monthly and annual, by States, 1931 746
See also Precipitation.
Raisins, exports—
1909–1932 670
destination, 1926–1932 677
Rancidity, oil-bearing foods, investigations 363
Rayon—
imports and price, 1923–1932 776
production and utilization 39–40
Real estate—
farm, index numbers, 1912–1932 733
values, discussion by Secretary 4–5
Reconstruction Finance Corporation act, administration 7–8
Regulatory work, administration by department 82–87
Research—
development of new ways to fight pests of fruits and vegetables. B. A. Porter and W. H. White 364–368
for—
adjusting crop production to demand 43–45
new uses of farm products 39–43
quality improvement of farm products 45–50
reduction of production costs 25–36
waste prevention and widening of markets 36–39
work of department, review by Secretary 21–52
Rice—
acreage and production, 1909–1932 464–465, 466
exports—
1909–1932 464, 671
destination, 1926–1932 679
flour and meal, imports, origin, 1926–1932 686
imports—
1909–1931 464
origin, 1926–1932 685–686
prices—
farm, 1909–1932 464–465
wholesale, at New Orleans, 1923–1931 468
receipts at mills, 1923–1932 467
trade, international, 1925–1931 467
world production, 1909–1933 465

Page

RICHEY, FREDERICK D.: Corn Hybrids Result from Crossing Carefully Selected Parent Lines 182-190
Road construction—
expenditures, statement by Secretary 17, 18-19, 21
use of emergency funds 88-89
Roads—
Federal-aid, construction—
1932 754-755
and expenditures 87-89
See also Highways.
ROBINSON, T. RALPH: Citrus Growers Try Out New Varieties as Supply of Standard Sorts Mounts. With A. D. Shamel 325-328
Rodents, control work of department 80
ROGERS, L. A.: Problem of Finding Uses for By-products of Dairy Industry Partly Solved 299-302
Root knot of cotton, cause, damage, and control 123-124
Rosin, consumption, 1925-1931 752
Rotation, crop, value in control of insect pests 218
Rubber—
crude, imports, 1909-1932 672
India, crude, imports, origin, 1926-1932 689
trade, international, 1925-1931 693
Ruminants, parasites, species, and control 230-237
Rust on cotton, cause, symptoms, and control 124-125
Rye—
acreage, 1909-1932 423-424, 426-427
commercial stocks, 1926-1932 428
exports—
1909-1932 671
destination, 1926-1932 679
marketing by farmers, 1922-1932 428
prices—
farm, 1909-1932 423, 430
market, 1909-1932 423-424, 430
production and yields, 1909-1932 423-424, 426-427
trade, international, 1925-1932 429
world production, 1894-1933 425

SALMON, S. C.—
Nearly 300 Varieties of Wheat Grown on United States Farms 147-153
Wheat's Rotation Use Is Largely Determined by Crop Competition. With John S. Cole 153-158
Sausage casings, imports, origin, 1926-1932 683
Seed—
forage-plant, imports, 1922-1932 588
verification service, benefits 75
Seeds—
field, prices, market, 1923-1932 588
imports, origin, 1926-1932 688
prices, market, 1923-1932 587
SEMPLE, A. T.—
Feeding Experiments With Cereal Grains Indicate Ways of Profitable Use 179-181
Pasture Experiments Point Way to More Profitable Grazing. With H. N. Vinall and C. R. Enlow 205-212
SHAMEL, A. D.: Citrus Growers Try Out New Varieties as Supply of Standard Sorts Mounts. With T. Ralph Robinson 325-328
Sheep—
industry—
1922-1932 227-228
trends 265
management systems 266-268
number—
in various countries, 1921-1931 612-613
on farms, 1900-1933 611, 614
prices—
1931-1932 227
at Chicago, 1923-1932 616
farm, 1923-1933 614, 615
production value, 1931 617-618
raising in U. S., changes since pioneer period. D. A. Spencer and C. G. Potts 264-273
receipts at stockyards, 1923-1932 614, 615
shearing method 270-271
shipments and slaughter, 1931 617-618
slaughter, under Federal inspection, 1880-1932 616
types and breeds, improvement 265-266
See also Lambs.

SHEETS, E. W.: Experiments with Beef and Dual-Purpose Cattle Aid in Efficient Production. With W. H. Black and J. A. Gamble 241-252
SHEPARD, J. B.: Changing Dollar Value and Production Cycle Greatly Affect Dairying. With E. W. Gaumnitz and E. E. Vial 275-280
SHERMAN, WELLS A.: Decade of Expansion Leaves Most Products Depressed; but a Few are in Active Demand. With O. Burmeister and A. C. Edwards 319-325
Silk—
imports, 1909-1932 672
raw, imports and price, 1923-1932 776
Sirup—
maple, production, 1917-1932 495
quality improvement by department 47
sorgo, acreage, production, and price, by States, 1930-1932 494
sugarcane, acreage, production, and price, by States, 1930-1932 495
Sisal, imports—
1909-1932 673
origin, 1926-1932 684
SKINNER, J. J.: Fertilizer Composition and Placement Play Big Part in Cotton Growing 118-121
Soils—
fertilizer requirements for cotton growing 115-116, 118-119
for wheat, types and fertilizer requirements 158-161
Sorghums—
acreage and production, 1919-1932 470
diseases and insects, control 197
grain—
breeding for "combine type" 196-197
cultural methods 198
drought-resistant, varieties grown in United States. John H. Martin 195-198
uses 195-196
prices—
farm, 1919-1932 470
market, 1919-1932 470, 471
receipts, 1923-1932 471
Soy sauce, possibilities for domestic production 41
Soybean—
meal, use as feed, fertilizer and food 200-202
oil—
imports, origin, 1926-1932 688
manufacture 200
prices, 1922-1932 569
production, 1922-1932 569
trade international, 1925-1931 568
uses 202
Soybeans—
acreage and production, 1922-1932 566-567
export to Europe 204-205
major crop in U. S., grown since 1898. W. J. Morse 198-205
prices—
farm, 1931-1933 567
market, 1923-1932 569
quality improvement by department 48
trade international, 1925-1931 568
use as food 202-203
variety adaptation and utilization 198-200
SPENCER, D. A.: Sheep Raising in U. S. Has Changed Greatly Since Pioneer Period. With C. G. Potts 264-273
Spices, imports, origin, 1926-1932 689
Spinach—
acreage and production, 1929-1932 554
car-lot shipments, 1921-1932 555
mosaic-resistant, development 344
prices, farm, 1929-1932 554
SPRAGUE, Gordon W.: Poultry Industry Fairly Resistant to Depression. With Samuel A. Jones and Alexander Sturges 303-308
Standards, Federal, promotion of trade 67-69
STANTON, T. R.: Oat Varieties Have Regional Adaptation; Remain Major Crop 191-195
Starch—
exports, 1909-1932 671
sweetpotato by-product, development and utilization 40

Page
State experiment stations, research, cooperation of department 50–52
States, payments to, statement by Secretary 17, 18–19
STIEBELING, HAZEL K.: Readjustments in Family Living Are as Drastic as Those Effected in Farming. With Hildegarde Kneeland 385–397
Stock. *See* Livestock.
Stockyard inspection, work of department 77
Storage, fruits and vegetables, investigations by department 37
Strawberries—
  acreage and production, 1929–1932 555
  car-lot shipments, 1928–1932 556
  prices, farm, 1929–1932 555
STURGES, ALEXANDER: Poultry Industry Fairly Resistant to Depression. With Samuel A. Jones and Gordon W. Sprague 303–308
Sugar—
  beet—
    world production, 1909–1933 489
    production, 1911–1932 486, 488–490
  cane, world production, 1909–1933 489
  exports—
    1909–1932 670
    destination, 1926–1932 681
  imports—
    1909–1932 673
    origin, 1926–1932 689
  maple—
    prices, 1917–1932 495
    production, 1917–1932 495
  milk, utilization, problems 301–302
  prices, 1923–1932 494
  production, 1909–1933 485–495
  production, trade, and supply available, 1909–1932 488
  statistics 484–496
  trade international, 1925–1931 492–493
Sugar beet—
  leaf hopper, control investigations 365–366
  varieties, development by department 26
Sugar beets—
  acreage and production, 1911–1932 484–486
  prices, 1911–1932 484–485
  yield per acre, 1911–1932 484–485
Sugarcane—
  production, 1909–1932 486–490
  rot-resistant variety, development by department 26
Sweetpotato—
  by-products, development and utilization 40
  diseases, control 336–337
  production, trends 324–325
  starch investigations 362
Sweetpotatoes—
  acreage and production, 1919–1932 552–553
  car-lot shipments, 1922–1932 553
  prices—
    farm, 1919–1932 552, 553, 554
    market, 1923–1933 553, 554
Swine—
  breeds of, and improvement, research 253–257
  slaughter under Federal inspection, 1880–1932 605
  parasites, types and control 237–238
  See also Hogs; Pigs.

Tannin, investigations by department 41
Taxes, farm, discussion by Secretary 5–6
Tea—
  imports—
    1909–1932 672
    origin, 1926–1932 689
  trade, international, 1925–1931 695
Temperature, selected points, by months, 1932 740–741
Tephrosin, development by department 33
Textiles, uses, investigations by department 72
THIBODEAUX, B. H.: American Cotton Holds Ground Despite Growth of Foreign Competition. With Lawrence Myers and L. D. Howell 97–107
THORNE, G. B.: Prices, Numbers, and Kinds of Animals Vastly Changed Since the War. With C. L. Harlan and C. A. Burmeister 219–230
Tick fever, cattle, eradication, work of department 77
Timber—
  free-use, cut from national forests, 1928–1931 752
  stand, growth, and depletion 746
Timothy seed—
  acreage, yield, and production, 1930–1932 584
  prices, farm, 1923–1932 586, 587
  receipts, 1923–1932 587
Tobacco—
  acreage—
    1890–1932 497–500
    and production, 1932 9, 10
  exporters, aid by foreign agricultural service 67
  exports—
    1890–1932 497, 507
    destination, 1926–1932 681
  grading service, progress 69
  imports, 1890–1932 497
  leaf, use in manufacture, 1922–1931 505
  prices—
    farm, 1890–1932 497
    market, 1927–1932 498–499, 501–503
  production, 1890–1932 497–503
  rot-resistant strains, development by department 28
  statistics 497–507
  stocks on hand, 1927–1932 501–504
  trade, international, 1925–1931 506
  unmanufactured—
    exports, 1909–1932 671
    imports, 1909–1932 672
    imports, origin, 1926–1932 689
  yields, 1890–1932 497–500
Tomato, blossom-end rot, prevalence and control 337–339
Tomatoes—
  acreage and production, 1929–1932 557
  canned, pack in United States, 1923–1931 558
  car-lot shipments, 1921–1932 558
  exports, 1923–1932 556
  fresh, imports, 1909–1932 672
  imports, 1923–1932 556
  prices, farm, 1929–1932 557
  production, 1923–1932 556
Trade, foreign. *See* Exports; Imports; *and under specific commodities.*
Transportation, costs and waste, reduction, work of Department 38
Truck crops. *See under specific crops.*
Tuberculosis control, work of department 77
Tung oil, domestic production, possibilities 44
Turkeys—
  prices, farm, 1923–1932 662
  raising—
    decreases 307–308
    importance 316
  See also Poultry.
Turpentine, consumption, 1925–1931 752

VALGREN, V. N.: Farmers Resourceful and Prompt in Making Needed Readjustments With C. L. Holmes 369–384
Veal—
  imports, 1913–1932 672
  See also Beef; Meat; Meats.
Vegetable—
  breeding, studies and results 335–344
  diseases, studies and results 335–344
  industry, trends 320–321, 322–325
  oils. *See* Oils, vegetable.
  pests, control, development of new methods. B. A. Porter and W. H. White 364–368
  products—
    exports and imports, value, 1929–1932 668
    exports, destination, 1926–1932 676–681
    imports, origin, 1926–1932 684–689
Vegetables—
  and fruits 319–325
  disease-resistant varieties, development by department 27
  frozen-pack, progress 346, 349, 359
  preservation methods 361–362
  statistics 508–560
  storage investigations by department 37
  unloads at markets, 1924–1932 561–562
  utilization, aid by chemical discoveries. Henry G. Knight 359–364

Velvetbeans— Page
acreage, yield, and production, 1930-1932 571
prices, 1930-1932 571
Verticillium wilt of cotton, cause, occurrence and damage 125
VIAL, E. E.: Changing Dollar Value and Production Cycle Greatly Affect Dairying. With E. W. Gaumnitz and J. B. Shepard 275-280
VINALL, H. N.: Pasture Experiments Point Way to More Profitable Grazing. With C. R. Enlow and A. T. Semple 205-212
Vitamin content of milk, sources and value 295-298

Wages, farm, index numbers, 1909-1932 732
Waite, M. B.: Control of Fruit and Nut Diseases by New Method Making Headway 354-359
Walnut bacteriosis, investigations 359
Walnuts—
imports, origin, 1926-1932 687
production and prices, 1923-1932 559
shelled, imports, 1909-1932 673
Warehouse act, benefit to farmers 84
Watermelons—
acreage and production, 1929-1932 559
car-lot shipments, 1923-1932 559-560
prices—
farm, 1929-1932 559
market, 1924-1932 560
Weights, equivalent measures 402
WESTOVER, H. L.: Alfalfa Losses from Bacterial Wilt Heavy; Resistant Kind Sought 212-216
Wheat—
acreage, 1890-1932 403-408, 410-411
black chaff, occurrence, damage, and control 168
commercial stocks, 1926-1933 413-414
crop, utilization, 1866-1932 143-145
economic position, effects of surpluses and world trade restrictions. G. A. Collier, Joseph L. Orr, and E. J. Working 139-147
exports—
1890-1932 403-404, 414-416
1909-1932 671
1932 12
destination, 1926-1932 679
flour, imports, origin, 1926-1932 686
foot rots, kinds, damage, and control 167
futures trading, 1924-1932 421-423
growing, 300 varieties on United States farms. *S. C. Salmon* 147-153
imports, origin, 1926-1932 686
infestation by rusts, smuts, and other destructive diseases. H. B. Humphrey 161-168
insect infestation at each life stage of plant. W. H. Larrimer 169-170
loams and fertilizers for. B. E. Brown 158-161
mosaic, occurrence, symptoms, and control 168
nematode disease, cause and control 168
new varieties and areas of production 151-153
pools, number, and quantity of wheat handled, 1921-1930 771
prices—
farm, 1890-1932 403-404, 415
market, 1890-1932 403-404, 406, 418-420

Wheat—Continued.
production— Page
and yields, 1890-1932 403-404, 406-412, 414
costs, 1931 706-707
domestic, 1866-1930, survey 139-143
quality, factors determining 150-151
receipts, 1923-1933 412-413
rotation use, determination by crop competition. John S. Cole and S. C. Salmon 153-158
rusts, importance, spread, and control 161-164
scab, cause, symptoms, and control 168
seeding—
date, determination and effects 156-157
time and methods 157-158
smuts, kinds, spread, and control 164-166
trade, international, 1925-1932 417
varieties—
adapted to various localities, selection 147-151
development by Department 26-27
work on 139-170
world—
production, 1890-1932 409-411
production and supplies 145-146
situation 146-147
WHITE, W. H.: Research Develops New Ways to Fight Pests of Fruits and Vegetables. With B. A. Porter 364-368
WHITE, WILLIAM: Quality in Dairy Products Depends on Numerous Factors Other Than the Butterfat. With C. J. Babcock 290-295
Wild-life—
refuges, acquisition, discussion by Secretary 64-65
See also Game.
Wilt, bacterial, of alfalfa, losses and resistance. H. L. Westover 212-216
Women, readjustments in the farm home 385-397
Wood-pulp production, 1899, 1904-1931 749
WOODWARD, T. E.: Better Feed Crops and Pastures Needed to Cut Dairy Production Costs 284-287
Wool—
exports and imports, 1910-1932 623
handling method 272
imports, origin, 1926-1932 683
industry, survey 264-266, 268
prices—
Boston, 1923-1932 624
farm, 1923-1932 623
London, 1923-1932 624-625
production—
1932 11
by States, 1930-1932 620
in various countries, 1923-1932 621
scouring wastes, investigations by department 41
situation, 1931 and 1932 227-228
trade, international, 1925-1931 622
unmanufactured, imports, 1909-1932 672
WORKING, E. J.: Wheat's Economic Position Affected by Surpluses and World Trade Restrictions. With G. A. Collier and Joseph L. Orr 139-147
World crisis and agriculture. L. H. Bean 91-95